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TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1901.

No. 363.

THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY, APPELLANT,

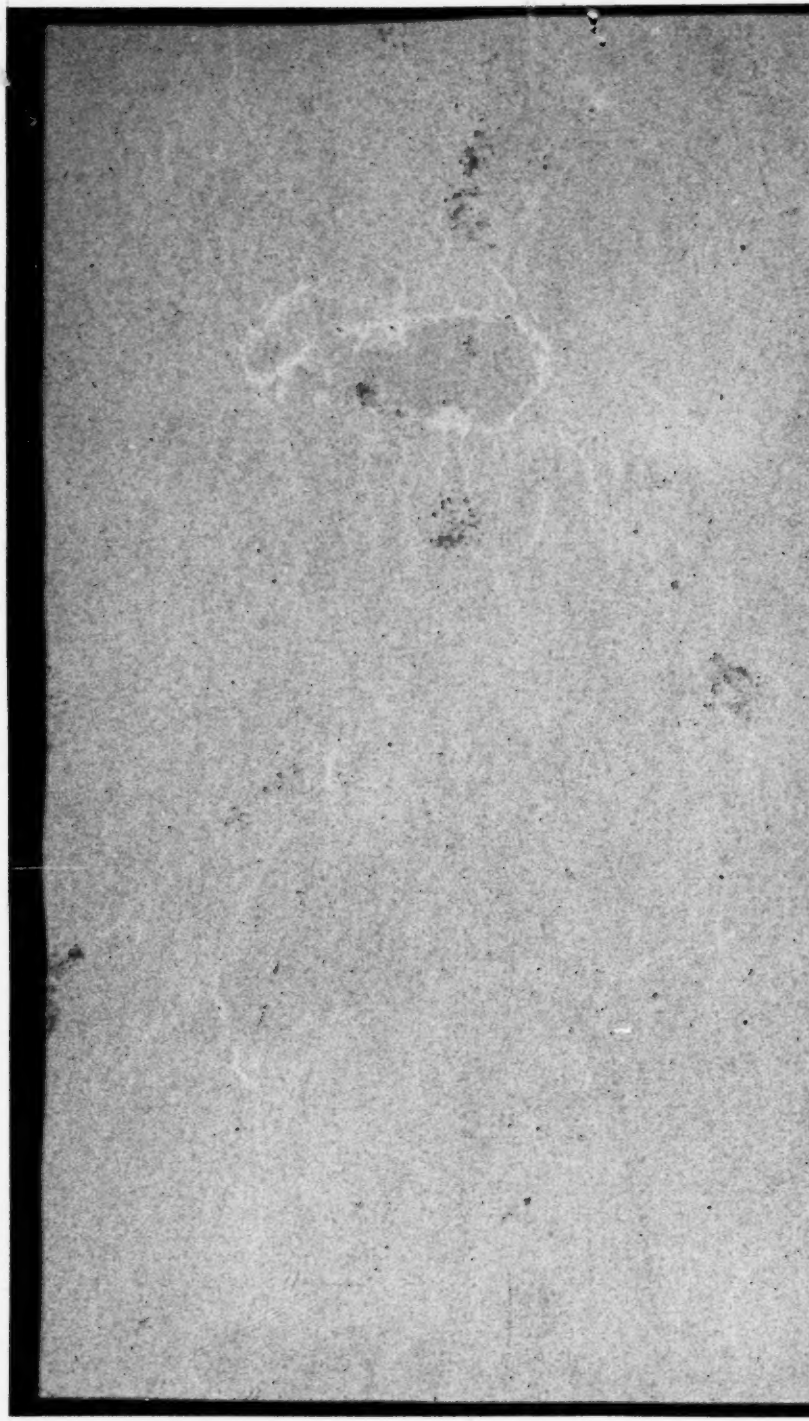
vs.

J. FORREST MANNING AND HARRY E. RUPPRECHT, TRADING AS J. FORREST MANNING & CO.

APPEAL FROM THE COURT OF APPEALS OF THE DISTRICT OF COLUMBIA.

FILED JULY 5, 1901.

(18,216.)



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In the Court of Appeals of the District of Columbia

J. Forrest Manning and Harry E. Rupprecht, trading as, J. Forrest Manning & Co., Appellants.
vs.
The Chesapeake and Potomac Telephone Company.
} No. 1003.

a In the Supreme Court of the District of Columbia.

J. Forrest Manning & Co.
vs.
The Chesapeake and Potomac Telephone Company.
} No. 19,558. In Equity.

United States of America,
District of Columbia.
} *ss:*

Be it remembered that in the supreme court of the District of Columbia, at the city of Washington, in said District, at the times hereinafter mentioned, the following papers were filed and proceedings had, in the above-entitled cause, to wit:

1 *Bill for Injunction.*

Filed July 14, 1898.

In the Supreme Court of the District of Columbia.

James F. Manning, and Harry E. Rupprecht, partners doing business under the name of J. F. Manning & Company, Complainants,
vs.
The Chesapeake and Potomac Telephone Company, Defendant.
} Equity. No. 19,558.

To the Supreme Court of the District of Columbia, Holding a Special Term in Equity:

The bill of complaint of James F. Manning and Harry E. Rupprecht, shows:

1. These complainants are citizens of the United States, residents of the District of Columbia, and are co-partners in business under the firm name of J. F. Manning & Company. They bring this suit in their own right.

2. The defendant, The Chesapeake and Potomac Telephone Company, is a corporation organized under the laws of the State of New York, and has its principal place of business in the City of Washington, District of Columbia; it is sued in its own right.

3. The complainants further say that said defendant is now and for a long time past has been engaged in the business of furnishing telephone exchange service in the District of Columbia and in the State of Maryland to persons who will or would enter into contract to accept such services and to pay for
2 the same the charges demanded by said company; and for the prosecution of its said business said defendant has with the assent and under the direction of the Congress of the United States and of the Commissioners of the District of Columbia laid, and yet maintains, in the public streets, avenues and alleys of the City of Washington many miles of conduit for the carrying of electric wire and has strung many other electric wires over and across other public avenues, streets, and alleys in said city and yet maintains the same, and over the said wires the said defendant for certain hire and reward suffers and permits to be transmitted by subscribers to its service, messages by telephone, the transmitting and receiving instruments for such messages being also provided by said defendant and placed by it in premises of each subscriber.

And said defendant also maintains a central office or exchange whereby means of certain appliances and of certain employees operating the same, different telephones may be connected, and messages sent and received. And complainants are advised and believed, and so believing aver that said defendant, The Chesapeake and Potomac Telephone Company, is a common carrier of telephone messages, and is bound in law to furnish, set up, and maintain telephones in the premises of all persons in the said City of Washington who may request the same and pay the lawful charges therefor (such premises being upon or near to the lines of service wire established by said company) and to furnish such persons, their families, servants, agents, and employees connection through said Telephone Exchange with other telephones, and to suffer and permit them to send and receive messages over said lines of wire.

4. The complainants further say that one of their several places of business is at the southeast corner 14th and H Sts. Northwest, in the City of Washington, and upon or very near to a line of service wires established by said company; that heretofore, to wit, on the first day of July, 1897, they entered into a contract in writing with the said company for telephone exchange service as aforesaid until the first day of July 1898, and thereafter until such agreement should be terminated by ten days' notice in writing given by either party to the other, at a certain price in said agreement fixed to be paid by these complainants. And thereupon said defendant presently set up in the said premises of these complainants at the corner of 14th and H Sts. Northwest, as aforesaid, a telephone and its necessary appliances and connected the same with said telephone exchange, and has ever since furnished these complainants telephone exchange service according to the true intent and meaning of said agreement; and these complainants on their part have at all times performed the things to be by them done under said contract and have paid the rentals by them agreed to be paid. And complainants say that on, to wit, the 2d day of July instant they gave notice in writing to the defendant that they desired to terminate said contract for telephone service at 14th and H Sts. Northwest ten days after the receipt of said notice by said company; and said notice was duly received by said company, as complainants believe on the fourth day of July 1898.

3

5. The complainants further show that by an act of the Congress of the United States, approved on the 1st day of July, 1898, it was among other things enacted that: From and after the passage of this act it shall be unlawful for any person or any telephone company doing business in the District of Columbia to charge or receive more than fifty (50) dollars per annum for the use of a telephone on a separate wire; forty (40) dollars for each telephone, there being not more than two on a wire; thirty (30) dollars for each telephone, there being not more than three on a wire, and twenty-five (25) dollars for each telephone, there being four or more on the same wire.

4

And complainants aver and charge that it is now unlawful that the said defendant company shall ask or receive for the use of any telephone more than fifty (50) dollars per annum, and further that it is and will be the duty of said defendants so long as it shall continue to carry on its said business as a public service corporation to furnish telephone exchange service to any person who may desire the same from premises on or near to the conduits or other service lines of said defendant, and who will pay the rate established by said act of Congress. Complainants further say that after they had given the notice of termination

of their heretofore existing contract with the defendant as provided therein, and on, to wit, the 12th day of July, 1898, they delivered to the defendant a notice in writing to the effect that these complainants desire to retain the said telephone equipment in said premises after the expiration of said contract so as aforesaid terminated by said notice hereinbefore recited, at the rate of payment fixed by the said act of Congress, that is to say, fifty (50) dollars per annum.

And at the same time the complainant tendered the
5 defendant the sum of $12.50 as payment in advance for the first quarter year of such service, it having been heretofore the custom of the defendant to require from the subscribers payment quarterly in advance. Your complainants are without definite information as to whether their telephone is the only one on the wire connecting it with the said telephone exchange, but assume and have assumed that such is the case and therefore made their tender at the highest rate of charge authorized by said statute; and complainants here renew their said tender and are ready and willing and now offer to bring into court, if it be so ordered, the sum of $12.50 as rent in advance for said telephone instruments, and telephone exchange service, for the first quarter of the year beginning on the 14th day of July, 1898; but so it is that said defendant, in defiant and contemptuous disregard of the said act of Congress, and of its duties under the law, refused and still refuses to accept the tender made by these complainants, as aforesaid, and has declared and still declares its purpose to remove from the said premises of the complainants the said telephone and its appliances and to refuse to render the complainants further telephone exchange service after said 14th day of July, 1898, unless upon payment of such a higher rate than fifty dollars per year, that is to say, one hundred forty-five (145) dollars per year in quarterly payments, with deductions of $2.50 from each quarter's rent for prompt payment thereof in advance. And your complainants verily believe, and, so believing, charge and aver that unless restrained by the action of this honorable
6 court said defendant will remove the telephone instrument from the said premises of complainant, and will refuse to continue to furnish telephone exchange service to them as by law they should continue, whereby complainants say their business will be greatly interrupted and injured, and they will be put to loss, annoyance, and embarrassment, for which they will have no adequate remedy at law.

The premises considered, and inasmuch as the complainants are without adequate remedy in the premises except in this court, where such matters are properly cognizable, they pray as follows:

1.

That process of subpoena may issue against the said defendant the Chesapeake and Potomac Telephone Company commanding it to appear and answer the exigency of this bill.

2.

That pending the final hearing of this cause and upon payment by these complainants into the Registry of this court for the use of the defendant the sum of twelve dollars and fifty cents, or such greater sum as the court may require as rent in advance from the 14th of July, 1898, for the said telephone instrument and said telephone exchange service to be rendered by the defendant, the said defendant, its officers, agents, and employees may be restrained and enjoined, by the order of this court, from removing or attempting to remove from the said premises of the complainants at the southeast corner of 14th and H Sts. Northwest the telephone and its appliances
7 by said defendant placed therein, and from neglecting or refusing to connect the same with other telephones in the City of Washington and elsewhere upon being requested so to do, and from neglecting or refusing to furnish telephone exchange service to the complainants for the said telephone in the same manner as it has heretofore furnished such service.

3.

That upon final hearing such temporary order of injunction may be made perpetual so long as these complainants shall continue to pay to the defendant quarterly in advance for such telephone and telephone exchange service at the rate of fifty dollars per annum.

4.

That complainants may have such other and further relief in the premises as the nature of the case may require and the court has power to grant. And your complainants will ever pray, etc.

J. F. MANNING & CO.,
By HARRY E. RUPPRECHT.

BIRNEY & WOODWARD,
J. J. HEMPHILL,
Counsel for Complts.

DISTRICT OF COLUMBIA, *ss:*

I, Harry E. Rupprecht, on oath say that I am one of the complainants in the foregoing bill of complaint by me subscribed and know the contents thereof; that the statements therein made as of my own knowledge are true, and those
8 made on information and belief I believe to be true.

HARRY E. RUPPRECHT.

Subscribed and sworn to before me this 13th day of July, 1898.

A. B. DENT,
[SEAL.] *Notary Public.*

9 *Answer of Defendant to Bill of Complaint.*

Filed, JULY 21, 1898.

In the Supreme Court of the District of Columbia.

JAMES F. MANNING and HARRY E. RUPPRECHT, partners doing business under the name of J. F. MANNING & COMPANY, Complaints, *vs.* THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY, Defendant.	Equity.	No. 19,558.

Now comes the defendant, The Chesapeake and Potomac Telephone Company, and for answer to the bill of complaint in the above entitled cause, and for answer to the rule, dated the 14th of July, 1898, requiring the defendant, on the 21st of July, 1898, to show cause why an injunction should not be granted as prayed in said bill; and, without waiving any objections to said bill, on account of the many errors and insufficiencies therein, but reserving the benefit thereof, the same as if taken by demurrer, for answer to said bill and rule to show cause, says:

1. This defendant admits paragraph 1 of said bill.

2. The defendant admits paragraph 2 of said bill.

3. The defendant admits the averments of paragraph 3 of said bill, with the exception that it denies that it is bound in law to furnish, set up, and maintain the telephones in the premises of all persons in the said city of Washington who may request the same. It avers that there are cases in which persons may request the use of a telephone near the lines of service wire
10 in which it is not within the power of the said defendant to furnish said service, on account of the fact that connection with the lines must be made through permits granted by the Commissioners of the District of Columbia, which permits the defendant cannot obtain; but the defendant admits

that in all cases where permits can be procured to connect parties desiring the use of the telephone with the line of service of the company, such persons are entitled to have the benefit of such connection and service upon paying the proper charges therefor.

4. The defendant admits paragraph 4 of said bill.

5. For answer to paragraph 5 of said bill this defendant says that it admits the enactment by Congress as set forth in said paragraph, which act was approved on the 30th day of June, 1898 (erroneously stated in said paragraph as having been approved on the 1st day of July, 1898); but this defendant denies that it is not unlawful "to ask or receive for the use of any telephone more than $50.00 per annum," as averred in said paragraph, and denies that it "will be the duty of the defendant, so long as it shall continue "to carry on its said business, to furnish telephone exchange service to any person who may desire the same on or near the conduits or other service lines of said defendant, and who would pay the rate established by said act," as averred in said complaint, and as will hereinafter be more specifically set forth. This defendant says that on the 1st day of July, 1897, the complainant entered into a contract for the use of a telephone for the year thence next ensuing, and continuing thereafter, until terminated by a notice of ten
11 days, at the rate of $125.00 per annum, net, for such telephone and telephone service, and for extra equipment for that special telephone at the rate of $10.00 per annum, said extra equipment consisting of a desk cabinet, and defendant avers that the telephone so furnished complainant under said contract was of the highest grade of telephone service furnished by it, and was and is of the grade known as the metallic circuit service. This defendant admits that on the 2d day of July, 1898, the said complainants notified the defendant that they, the complainants, desired to terminate their said contract of date July 1, 1897, for a telephone service at 14th and H streets, ten days after the receipt of such notice; and further admits that said notice was received by defendant, and that on the 5th day of July, 1898, it acknowledged the receipt of the said notice, and advised the complainants, pursuant thereto, that the telephone would be removed on the 14th of July, 1898. The defendant further admits, and avers the fact to be, that afterwards, to wit, on the 12th day of July, 1898, the said complainants notified the defendant that after the then existing contract should have expired, pursuant to the notice to that effect, hereinbefore mentioned, they would retain the telephone on the premises, at 14th and H streets, at the rate fixed by the said act of Congress on the subject, that is to say, $50.00 per year; and it further admits that the said complainants, on the 12th of July, 1898, tendered to the defendant $12.50, as payment

in advance for the first quarter year at the said rate of $50.00 per annum; and it further admits, and avers the fact to be, that the defendant declined to furnish said telephone and said
12 telephone service at the said rate, and declined to accept the said sum of $12.50 for the first quarter as aforesaid, and refused to furnish said telephone service at said rate, for the reason, among others, as stated to the complainants, that the rates named in said act, and tendered by the complainants, are less than the actual cost to the Company for furnishing such telephones and telephone service; and it then, and at the same time, offered to furnish to the complainants telephone service at the rates, and in accordance with the conditions, named in the then existing contract, or to furnish any other service it is able to supply at the rates, and under the conditions, it has established for such service.

A copy of the contract between the complainants and the defendant is hereunto annexed, marked Exhibit A, and copies of the correspondence in relation to the discontinuance of said contract, and the demand for service at the rate named in said Act of Congress, the tender made by the Complainants, the refusal to accept the same by the defendant, and the offer to continue the service at the rates at which it had theretofore been furnished, are herewith filed, and made a part hereof, marked Exhibits B, C, D and E.

This defendant, further answering the said paragraph, is advised by counsel, therefore so avers that the said Act of Congress, even if it were valid, which is denied as hereinafter more specifically appears, has no application to any individual desiring telephone service, but applies only to such service as may be rendered for the public to the District of Columbia, for the service rendered to said District for fire alarm, police, and
13 other public purposes; and this defendant further avers that, even if the said Act does apply to private parties who may desire to have telephonic service, it is not now, as averred in said paragraph, unlawful for the said defendant to ask or receive for the use of any telephone more than $50.00 per annum, etc., as in said Act provided. It avers the truth to be that the said rates fixed in said Act are arbitrary, unjust, unreasonable, and unconscionable; that the said defendant has a large, valuable, and expensive plant, consisting of conduits, cables, poles, wires, switchboards, and all the necessary appliances for the furnishing of telephonic service of the highest grade known to the art, and that it now, and for some years past has been supplying to persons desiring to have the same without any discrimination of any kind or character whatsoever, all the best telephone service that the best appliances now known will afford; that it keeps a large force of thoroughly skilled and competent employees, and does every thing neces-

sary for the purpose of supplying such service; that in supplying said service defendant is subjected to heavy expenses for maintaining and operating its said business, and performing its duty toward its patrons and the public, and meeting interest charges for moneys procured and used in the creation of its said property, and that the actual cost to defendant in furnishing the said service is largely in excees of the rates named in the said Act of Congress; and that the actual cost of supplying the complainants with the service that they are demanding subjects the defendant to an expenditure of a large amount of money in excess of the maximum amount named in the said Act
of Congress, and tendered by the Complainants, as in
14 their bill averred.

And this defendant avers that if all the telephones in use in the said District of Columbia were at the highest rate named in said Act of Congress, the revenues derived therefrom would be insufficient to meet the necessary outlays in conducting its said business, and that telephone service of any of the kinds, or of all the kinds, distributively as the same have heretofore been used, cannot be furnished at the rates named in said Act without an actual loss to the defendant, and that the same would not furnish sufficient revenue, to meet the necessary outlays in conducting its said business.

And this defendant, on the advice of counsel, avers that it is not within the power of Congress of the United States to compel the defendant to furnish to the complainants telephone service at less than its cost to the defendant to furnish the same, and avers that if service is required to be furnished at such rates, it will be destructive of the defendant's business, a practical confiscation of its property, and a deprivation of its property and property rights without just compensation or due process of law.

And defendant further says that the refusal by it to furnish the complainants with the telephone service demanded by them was because of the matters hereinbefore set forth and not otherwise.

In support of the foregoing answer, this defendant refers to the affidavits filed herewith, and by reference thereto made part hereof.

And having fully answered, the defendant prays that
15 the rule to show cause issued herein be discharged, and that upon final hearing thereof, the bill of complaint may be dismissed.

THE CHESAPEAKE & POTOMAC TELEPHONE CO.
By SAML. M. BRYAN, *its President.*

H. W. UPPERMANN,
Secretary. [CORPORATE SEAL.]

J. M. WILSON,
Solicitor for Defendant.

DISTRICT OF COLUMBIA, *ss:*

BEFORE ME the undersigned, personally appeared SAMUEL M. BRYAN, who being by me first duly sworn, on oath says: that he is President of the Chesapeake and Potomac Telephone Company; that he has read the foregoing answer by him subscribed, as such President aforesaid, and has personal knowledge of the facts therein set forth, and that the several matters and things therein stated of his own knowledge are true, and those stated upon information and belief, he believes to be true.

SAML. M. BRYAN.

SUBSCRIBED and sworn to before me this 21st day of July, A. D. 1898.

H. W. UPPERMANN,
Notary Public, D. C.

[SEAL.]

(2 INTERNAL REVENUE STAMPS.)

16 EXHIBIT "A."

Read this contract.—(*Spl. Met. Cir.* 125; *Desk Cabinet*, 10; $135.)—*Subscription to the exchange of the Chesapeake and Potomac Telephone Company.*—*Rental begins July* 6, 1897, —*Rules and Regulations.*

All contracts for Telephone Exchange service furnished by The Chesapeake and Potomac Telephone Company must be made in writing, or partly in print and partly in writing, and must contain the following *terms and conditions*, namely:

The instruments and lines on the subscriber's premises shall be for the subscriber's use only, and carefully used, and only as herein stated; all ordinary expense of maintenance and repair thereof to be borne by The Chesapeake and Potomac Telephone Company. The subscriber is to pay $10 for each telephone or transmitter destroyed otherwise than by unavoidable accident, and $25 per month in case of unauthorized removal or detention of such telephone or transmitter, until its destruction or its loss, without his fault, is satisfactorily proved; but the payment shall not confer any title to the instruments or right to use them otherwise than is provided by the regulations of this Company. In case of interruption of communication, from any cause whatever, the liability of the Company therefor shall be limited to a repayment, or rebate by it, of a proportionate part of the yearly rental below named for the time such interruption shall continue after twenty-four hours' written notice to the Company of such interruption. No repayment or rebate will be made for interruptions, unless such interruptions aggregate more than three days in any month, nor for those caused by the negligence or willful interference of the subscriber or of his agents or serv-

ants. The Company shall not be liable for any loss or injury caused by interruption of, or failure to restore communication, except in the case and to the extent above provided. The said Company will remove the instruments from place to place during the continuance of this contract, within the territory covered by the lines of the Exchange to which he is a subscriber, upon request and payment of the expense thereof. Upon non-payment of any sum due, or payable, by the subscriber, under his subscription to such Exchange, or of any use of the instruments on said premises improper or contrary to these regulations, or of any removal therefrom, or of any breach by a subscriber of any of these regulations, the said Company may terminate the subscriber's right to use such instruments by twenty-four hours' written notice served on him or any occupant of the premises or set up on the premises, and sever his connection and remove the instruments; and for this purpose and for all purposes of inspection it and its servants may have access thereto.

The right of the subscriber is to use the instruments and connecting wires where the said Company may place them, under such rules as the said Company may from time to time prescribe, for the purpose of the subscriber's communication with its Exchange, and parties with whom the said Exchange may connect him for that purpose, upon his and their business. They are not to be used for any toll or consideration to be paid by any person other than the subscriber, nor for performing any part of the work of collecting, transmitting, or delivering any message in respect of which any toll or consideration has been or is to be paid to any party other than the said Company, nor for transmitting market quotations or news for sale, publication, or distribution, nor for calling messengers, except from the Central Office of said Company, or performing any other service in competition with service which the said Company may undertake to perform. Said Telephone and Transmitter instruments are the property of the American Bell Telephone Company, are constructed and used under its patents, and are leased and licensed by it only for the uses above stated, in consideration of a royalty and rental which it is to receive therefor, part of the payment named below, and which The Chesapeake and Potomac Telephone Company is authorized to collect for a period not exceeding one year in advance; but any use otherwise or without the payment of said rental or royalty is also an injury to and an invasion of the said rights of the American Bell Telephone Company, entitling it to an injunction and other legal redress in a suit in its name and behalf, and to the remedies, by taking possession of instruments and lines, and collecting rentals from the subscriber, as provided in the contract between the said Company and the said The Chesapeake and Potomac Tele-

phone Company, and which the subscriber agrees to permit and to pay.

In view of the liabilities to errors in transmitting oral messages by telephone, and the impossibility of fairly fixing the cause thereof, the subscriber assumes all the risks of errors from misconnections or mistakes upon and by any telephone line, and the officers and servants of the Company owning such line, in transmitting, receiving or delivering messages; and in respect of any message which may be sent or received by or for him over any other telephone or telegraph line, no line shall be responsible for defaults occurring on any other line, nor on its own lines, except as specified in its usual contracts, nor for any damages, unless the claim therefor be presented in writing within thirty days after sending the message, and he makes the said The Chesapeake and Potomac Telephone Company and its agents, and the agents of every other line over which said message may pass, his agent to receive the same, to forward it towards destination at the rate of unrepeated messages, and for that purpose to bind him by the contracts on the usual blanks, and make the message subject to the usual limitations, rules and regulations, to which he hereby agrees. He will reimburse the said The Chesapeake and Potomac Telephone Company for all tolls it may pay on such messages.

No instrument or appliance of any kind whatsoever not furnished by the said Company shall be attached to, or used in connection with the instruments furnished by the said Company, without the consent, in writing, of the said Company first obtained therefor; and no instrument furnished by the said Company shall be used in connection with any such unauthorized instrument or appliance.

In case of the passage of a law which, in the opinion of the said Company, shall tend to materially increase the cost of maintaining wire communication between subscribers, the Company may, at its option, terminate the contract and remove the instruments before the expiration of the term hereinafter stated.

All the obligations of the contract of any subscriber to the Telephone Exchange of this Company are binding on such subscriber until the instruments shall be redelivered to the said Company, or the American Bell Telephone Company, or, until, being bound and requested so to do, and having an opportunity to remove the same, they shall neglect to do so. All words herein referring to the subscriber shall be taken to be of such number and gender as the character of the subscriber may require.

Either the Company, or the subscriber, may terminate any contract for telephone service after the expiration of the term for which it was made by giving ten days' notice in writing to the other party to such contract, but every such contract shall

be deemed as continuing on the same terms, after the expiration of such term, unless it is terminated by such notice.

Each subscriber to said Telephone Exchange shall pay to the said Company quarterly in advance, unless otherwise stipulated below, the rental, or sum, payable by such subscriber for the use of such instruments and connections, commencing as soon as the instruments shall be placed and connected, and also pay to the said Company the value, at the Company's selling price, of each Bell or Combination, consisting of Magneto Bell, Auxiliary Bell, or Bells, Battery Box, Battery, Cord, etc., or any part thereof, lost or destroyed on the premises of said subscriber during the continuance of this contract; and shall also pay to the Company the charges for all toll messages sent through the instruments on his premises.

The subscriber requests The Chesapeake and Potomac Telephone Company to place in the premises S. E. Cor. 14th and H Sts. N. W. one magneto telephone, one "solid back" battery transmitter, with necessary battery, and one magneto call bell, Desk Cabinet, and to connect the same by means of a Complete Special Metallic Circuit, consisting of two wires, with the Company's Exchange at Washington, D. C., for the use of the subscriber only, until the first day of July, 1898, and thereafter until this agreement is terminated by ten days' notice in writing given by either party to the other, upon the terms and conditions stated above which he hereby promises to keep and perform, and agrees to pay to the said Company for Such Instruments and Telephone Connections at the rate of one hundred and forty-five dollars per annum, payable quarterly in advance, beginning as soon as the instruments shall be placed and connected.

A discount of two dollars and fifty cents per quarter will be allowed upon this contract, if payment be made in advance as stipulated, at the office of the Company, 619 14th Street N. W., Washington, D. C., within the first ten days of January, April, July and October of each year.

This request becomes a binding contract as soon as accepted by the President of the said The Chesapeake and Potomac Telephone Company as shown by his signature hereto. Its terms cannot be varied or waived by any representations or promises of any canvasser or other person, unless the same be in writing and signed by the President of said Company. The subscriber hereby acknowledges the receipt of a duplicate hereof.

Signed at Washington, D. C., July 1, 1897.

Accepted by The Chesapeake and Potomac Telephone Company.

(Signed) J. F. MANNING & CO.,
Monumental Cut Stone and Interior Marble Work.

(Signed) SAM'L M. BRYAN,
President.

Marked "copy" in ink across face of Exhibit "A."

17 EXHIBIT "B."

(Printed Heading.)

Washington, D. C., July 2d, 1898.

Chesapeake & Potomac Telephone Co., Washington, D. C.

Gentlemen: We hereby give notice that we desire to terminate our contract, under date of July 1st, 1897, for telephone service at 14th & H Sts. N. W., ten days next after the receipt of this notice by you.

You will kindly send us a bill for telephone service due at the date of said termination of our contract.

Very respectfully,

(Signed) J. F. MANNING & CO.

DIC.

18 EXHIBIT "C."

THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.

No. 619 Fourteenth Street, N. W.

(Copy.) Washington, D. C., July 5th, 1898.

Messrs. J. F. Manning and Company, 14th and H Streets, N. W., Washington, D. C.

Dears Sirs: I have your letter of the 2nd of July, which was only received on the 4th instant, in which you give notice that you desire to terminate your contract for telephone service at 14th and H Streets, N. W., ten days after the receipt of this notice by me.

The telephone will be removed on the 14th instant, and a bill be sent you for the amount due to that date,

Yours very truly,

(Signed) SAM'L M. BRYAN,
President and General Manager.

19 EXHIBIT "D."

(Printed Heading.)

Washington, D. C., July 12, 1898.

Chesapeake and Potomac Telephone Co., Washington, D. C.

Gentlemen: We hereby notify you that after our present contract with you shall have expired, pursuant to our notice sent you, we will retain the telephone on our premises, 14th & H Sts. N. W., at the rate fixed by the recent Act of Congress on

the subject, that is to say fifty dollars ($50) per year, and we hand you herewith twelve dollars and fifty cents ($12.50) as payment in advance for the first quarter year.

Yours, very truly,

(Signed.) J. F. MANNING & CO.

Dictated by H. E. R.

20 EXHIBIT "E."

THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.

619 Fourteenth Street, N. W.

(Copy)

Enclose. Washington, D. C., July 13th, 1898.

Messrs. J. F. Manning and Company, 14th and H Sts., N. W., Washington, D. C.

Dear Sirs:—I beg to acknowledge receipt of your letter of the 12th. instant, notifying this Company that, after your present contract shall have expired, pursuant to the notice previously received from you, you will retain the telephone in your premises at 14th and H Streets, N. W., at the rate fixed by the recent Act of Congress; that is to say; $50.00 per year, and handing me $12.50 as payment in advance for the first quarter.

In response, I beg to re-enclose to you the $12.50, and, for your information, to state that this Company cannot furnish telephone service, including lines and equipment, at the rates named in the Act above referred to, for the reason, amongst others, that these rates are less than the actual cost to the Company.

The Company will be pleased to continue to furnish you, telephone service at the rate, and in accordance with the conditions, named in your present contract, or to furnish you any other service it is able to supply at the rates, and under the conditions, it has established for such service.

Yours very truly,

SAM'L M. BRYAN,

President and General Manager.

21 *Injunction Pendente Lite. Filed*, August 4, 1898.

In the Supreme Court of the District of Columbia.

JAMES F. MANNING & CO., *vs.* THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.	Equity. No. 19,558.

This cause coming on to be heard on the application of the complainants for an injunction pendente lite as prayed in their

bill, and having been argued by counsel, it is this 4th day of August 1898, Ordered, that upon payment by the complainants to the defendant of the sum of twelve dollars and fifty cents as one quarters rent for the use of the telephone described in their bill, the defendant its officers, agents and employes be, and they are hereby during the pendency of this suit restrained and enjoined from removing or attempting to remove from the premises of the complainants described in the Bill of Complaint, the telephone and its appliances by said defendant heretofore placed therein, and from refusing or neglecting to connect the same with other telephones upon being requested so to do, and from neglecting or refusing to furnish telephone exchange service to the complainants for the said telephone in the same manner as it has heretofore furnished such service; provided however, that said complainants shall file their undertaking with surety or sureties to be approved by the Court, conditioned to make good to the defendant any damages it may sustain through the wrongful sueing out of this injunction, in
22 conformity with the rules of practice of this Court.

It is further ordered that the complainants at the expiration of each three months hereafter during the pendency of this suit, pay to the defendant the further sum of twelve dollars and fifty cents for the use of said telephone and for said telephone service.

By the Court: A. B. HAGNER,
Asso. Justice.

23 *Order for Consolidation, and Limiting Time to Take Testimony. Filed, November* 17, 1898.

In the Supreme Court of the District of Columbia.

JAMES F. MANNING *et al.*,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.
} No. 19,558. In Equity

Upon motion of the solicitors for the defendant in this case and in the cases hereinbelow referred to, and after hearing argument by counsel for the respective complianants and for the defendant in this case and in said other cases, it is, this 17th day of November, A. D. 1898, ordered:

That this case and the fifty other cases referred to in the list hereto appended and made part hereof, be and they are hereby consolidated.

That all depositions taken and evidence introduced on behalf of the complainants in this case shall be deemed to have been

taken and filed, and may be used, on behalf of the respective complainants in said other cases, and that all depositions taken and evidence introduced on behalf of the defendant in this case shall be deemed to have been taken and filed, and may be used, on behalf of the defendant in each of said other cases.

That no additional deposition shall be taken and no additional evidence shall be introduced on behalf of either of the parties to any of said other cases, except as to issues of fact, if any, in which said cases, or any of them, may differ from
24 this case.

That this case and all said other cases shall be set down for final hearing and shall be heard together, but that a separate final decree shall be entered in each case.

The solicitors for the complainants in this and in said other cases having in open court waived their right to take depositions in support of their respective bills of complaint, it is further ordered that the defendant in this case and in said other cases be allowed to and including the 10th day of December, 1898, to take depositions in support of its answer in said cases, and that the respective complainants be allowed thirty days after the defendant shall have closed its testimany for the purpose of taking depositions in reply to its evidence.

A. B. HAGNER,
Asso. Justice.

25 *Injunction Suits.*

Against The Chesapeake and Potomac Telephone Company.

In Equity No.	19,580	Thompson, H. P. P.
"	19,581	Hartig, Louis
"	19,558	Manning and Company,
"	19,571	Veerhoff, W. H.
"	19,586	Moran, John
"	19,585	Moses, W. B. & Sons.
"	19,564	Muehleisen, William
"	19,590	Sheehy, P. H.
"	19,593	Hoge and Brother,
"	19,597	Merrill, G. W. & Company
"	19,596	Washington National Building and Loan Association.
"	19,602	Roth, J. P.
"	19,608	Estler Brothers and Company.
"	19,609	Talbert, R. T.
"	19,613	Mann, P.
"	19,614	Hendrickson and Company,
"	19,627	Barker, W. S.
"	19,653	Fisher, W. H.

	"	19,802	Bryan, Charles C.
	"	19,785	King, George A.
	"	19,803	Jorss, A. Fred.
	"	19,806	Manning, J. F. & Company,
	"	19,788	Bowers, E. A.
	"	19,795	Danenhower & Company
	"	19,820	Vinson and Perry
	"	19,818	Moses, W. B. & Sons
	"	19,817	Moses, W. H.
	"	19,819	Lafferty, E. B.
	"	19,849	Altemus, G. C.
26	"	19,831	Hammond G. H. Company
	"	19,832	Gasch Brothers.
	"	19,830	Mertz, E. P. Company
	"	19,829	German American Fire Insurance Company
	"	19,842	Eberly's A. Sons
	"	19,879	Denison, F. A. & Company
	"	19,887	Hospital, Frank D.
	"	19,886	Mt. Vernon Steamboat Company,
	"	19,888	Weedon, J. C. & Company
	"	19,885	Bentley, E. J.
	"	19,880	Holmes Brothers,
	"	19,881	Collins & Gaddis
	"	19,893	Taylor and Paine,
	"	19,895	Brooke, W. I. and Company
	"	19,898	Wheeler, B. L.
	"	19,894	Stohlman, Frederick
	"	19,897	Walters and Company
	"	19,900	Harvey and Gaylor
	"	19,894	Offutt, Henry W.
	"	19,905	Coleman, W. H.
	"	19,904	Duparquet, Huot and Moneuse Company,
	"	19,903	W. G. Lown Coffee Co.

27

NOTE:

For Testimony on behalf of Complainants,' Filed, Nov. 9, 1899.
" " " " " Defendant, " " " "
and
" " " " " " in rebuttal " Nov. 11, 1899.

See Volumes marked I, II, III.

28 *Memorandum.*

DEFENDANTS' EXHIBIT NO. 1.

Omitted by Stipulation of Counsel.

29 EXHIBIT "NO. 2." *Filed, November* 9, 1899.

Whereas, Alexander Graham Bell has made certain inventions and discoveries in regard to the transmission of the sound of the human voice and has obtained letters patent of the United States numbered 161,739, 174,465, 178,399 and 186,787 for certain instruments used therein, termed telephones, which inventions and discoveries he is desirous to make available to the public;

And whereas the party of the second part hereto desires to secure and control the use of said telephones within the territory and for the purposes hereinafter mentioned as hereinafter provided for;

Now this agreement, made and entered into this twenty-second day of April, 1878, between Gardiner G. Hubbard, as trustee of said patents, party of the first part, and George C. Maynard, of Washington, D. C., party of the second part, witnesseth:

1. The term telephone, whenever and in this contract, means instruments made under the above-mentioned patents, and all patents which the party of the first part or the said inventor now has or may hereafter obtain for improvements to said instruments, and all beneficial modifications thereof which he shall be at any time authorized to use.

* * *

Second—1. The party of the first part agrees that he appoints said party of the second part sole agent to lease telephones and to make contracts in the District of Columbia, including all Government establishments located within
30 a radius of ten miles of the Capitol, and in the territory embraced in the Fifth United States light-house district, as shown by the map hereto annexed (but no contracts are to be made in said light-house district except for Government use), except as herein otherwise expressly provided, and to collect all moneys for the rent of telephones, and at his own expense to take proceedings for the collection of said moneys.

2. That he will supply said party of the second part with telephones and suitable call bells to be used therewith, as he needs them to supply lessees and purchasers, and also to supply such as may be worn out or destroyed; such telephones and call bells to be delivered at the office of the Bell Telephone

Company in Boston, and the advance of two dollars on each telephone and three dollars on each call bell to be paid by the party of the second part.

3. The party of the second part agrees [1st]* that he will construct, with capital furnished by him, in the most approved manner, any and all lines which may be reasonably required in said District by any proper person for use in connection with telephones, said lines to be hired or sold at reasonable terms.

The rental price may be a gross sum as rental for telephones and lines, in which event the schedule rates herein shall be the sum apportioned as the rental for telephones.

Where parties prefer to construct their own lines said party of the second part agrees to furnish telephones to operate them.

2. That the party of the second part will use his best
31 efforts, in all proper ways, to introduce telephones to the utmost possible extent, and to preserve leases therefor for use in the District hereinbefore mentioned and described.

3. As the agent of the said party of the first part, to make contracts for the leasing and hiring of telephones within the said District, and at his own expense to collect the rent therefor and take all proper proceedings for the enforcement of said leases, and to forward said leases quarterly to said party of the first part.

* * *

4. Said party of the second part shall receive as his commission for the services hereinbefore mentioned, and as full compensation for all services rendered and disbursements paid for the party of the first part in connection with said telephones, fifty per centum of all moneys secured for the rent of telephones and twenty per centum of all moneys received for the rent or sale of call bells used in said District and territory, whether leased or sold through the agency of the party of the second part or otherwise, howsoever (except in the case provided for in section 1 of this fourth subdivision); but upon the termination of this contract all rights in outstanding leases and the rents therefrom to cease as herein provided.

5. The amount to be charged for the rental of telephones to all parties other than the Government of the United States and the District of Columbia, shall be fixed at rates as per schedule hereto annexed, which said schedules may be varied by
32 the party of the first part from time to time in conformity with prices charged in other places, this contract in other respects remaining unaffected thereby.

* * *

9. This contract, if in all respects complied with by the party of the second part, shall remain in force for the term of six years and until three months notice thereafter by either party of their desire to terminate it.

---

*Word in brackets inserted in pencil.

10. In case of any misunderstanding between the parties hereto, in relation to the provisions of this contract, the matter may be referred to three disinterested persons, one to be selected by the party of the first part, one by the party of the second part, and the third by the two referees so selected.

11. Nothing herein contained shall in any manner impose any liability on the party of the second part to pay the legal or any expenses incident upon sustaining said telephone patents should the same be questioned, or the cost of punishing any violation thereof; but said suits, if instituted at all, shall be instituted by and at the sole expense of the party of the first part, and the party of the first part will on reasonable notice defend and indemnify the party of the second part in the right to use, lease, and sell said telephones, but shall have the exclusive right to designate and retain attorneys and counsel for that purpose.

In witness whereof the parties hereto have set their hands the day and year first above written.

GARDINER G. HUBBARD, *Trustee.*
GEO. C. MAYNARD.

33 NOTE: Papers attached to this agreement are Bell Telephone Company's instructions to agents, No. 1, No. 2, and No. 3, and official map of the Fifth light-house district corrected up to June 30, 1877. Patent Office stamp, U. S. Patent Office. Received for Record March 17, 1879. Recorded Liber 823, p. 383.

Second Agreement.

Whereas an agreement in writing was entered into on the 22d day of April, 1878, between Gardiner G. Hubbard, trustee for the Bell Telephone Company, and George C. Maynard, of Washington, D. C., appointing said Maynard sole agent for the renting of telephones in the territory therein mentioned; and whereas said agreement has been assigned by said Hubbard, trustee, to the said Bell Telephone Company; and whereas the said Maynard has agreed to introduce the district or exchange telephone system into Washington and suburbs if certain modifications are made in said agreement;

Now, therefore, it is hereby agreed, this second day of December, 1878, by the said Maynard that he will forthwith establish such district or exchange telephone system and extend it from time to time, as rapidly as possible and the public need may require and furnish the same to subscribers at fair rates, not exceeding the rates charged in other cities of like population.

The Bell Telephone Company hereby agrees to modify and extend the provisions of the second section of the first article of said agreement of the 22d of April, 1878, whereby said agreement is made a personal contract with said Maynard,
34 and full permission is hereby granted to said Maynard to associate with himself one or more partners, for the purpose of carrying on said district or exchange system or to organize a joint stock company to carry on said business; but the provisions of said agreement of April 22, 1878, shall be held to apply to the said district or exchange system, and such partnership or joint stock company shall be bound by said provisions so far as they are applicable to the business of such district or exchange system.

The license or permission hereby granted shall continue during the life of the said patents mentioned in said agreement, and of all reissues thereof or improvements thereon: *Provided, however*, If there shall be any failure to organize said system, or to prosecute the business with all reasonable dispatch and in the manner herein provided, or to pay any rental due said Bell Telephone Company from any instrument furnished by it for said district or exchange business, the said Bell Telephone Company shall have the right, after reasonable notice, to be, in any event, not less than sixty days, to the parties carrying on said business, to enter into and take possession of the premises and of any and all telephones, lines and fixtures, and other property belonging to such partnership or joint stock company, and used in carrying on such business, and to take and hold possession thereof, for the purpose of continuing said business during the continuance of such breach.

Said parties may regain possession of such property and the business upon performing whatever may be in arrears
35 and paying all proper expenses which said Bell Telephone Company may have incurred in consequence of such breach, together with any arrearanges of rent.

Said Bell Telephone Company further agrees to extend the time of that portion of said Maynard's contract relating to private lines, and all other business excepting that of the District or exchange systems, for the life of the said patents, and of all re-issues thereof or improvements thereon, provided the said Maynard shall live so long, and in case of his death during the lifetime of said patents, or any of them, all rights conferred on said Maynard shall continue either to his representatives, if he be alone in business, or to the partnership or joint stock company which may be carrying on the business for him: *Provided*, That, if he die while carrying on the business alone, his executor or administrator, shall nominate some person to act as agent for the Bell Telephone Company in his place, and for the

benefit of his estate. If the person so nominated shall not be acceptable to said company, then an agent shall be selected by arbitrators, one arbitrator to be appointed by said company, another by said executor or administrator, and in case of disagreement, a third by them.

In witness whereof the said parties have executed these presents, this 2d day of December, 1878.

THE BELL TELEPHONE CO.
By its Trustee, GARDINER G. HUBBARD,
GEO. C. MAYNARD.

NOTE: U. S. Patent Office. Received for record March 17, 1879. Recorded Liber 823, p. 394.

36 *Third Agreement.*

Whereas an agreement was entered into on the 22nd day of April 1878, by and between Gardiner G. Hubbard, trustee, for the Bell Telephone Company, and George C. Maynard, of Washington, D. C., appointing said Maynard sole agent for renting of telephones in the territory described therein, which said agreement was assigned by said Hubbard to the Bell Telephone Company:

And whereas the said agreement was amended by said Bell Telephone Company and said Maynard, by joint agreement, dated the second day of December, 1878;

And whereas the said agreement, as amended, has been transferred and assigned by said Bell Telephone Company to the National Bell Telephone Company;

And whereas the National Bell Telephone Company, by a proposed agreement with the Western Union Telegraph Company, representing and acting for the Gold and Stock Telegraph Company, the American Speaking Telephone Company, and the Harmonic Telegraph Company, can, under certain conditions, obtain full and exclusive license to make and to use speaking telephones, call bells, and switches, and other appliances for use in telephone lines, and any inventions or improvements applicable thereto which it or those whom it represents as aforesaid now own or control in whole or in part by contract or otherwise:

Now, therefore, the National Bell Telephone Company and the said George C. Maynard do agree as follows:

That the National Bell Telephone Company shall and does hereby grant and convey to said Maynard and his assigns and legal representatives exclusive license, except as hereinafter provided, to use telephones under any patents now held or

which may be hereafter held or controlled by said National Bell Telephone Company, or which the said company now has or may hereafter have a right to use, such telephones to be used solely in the territory described in the before-mentioned agreement with the said Maynard.

That the said National Bell Telephone Company will acquire from said Western Union Telegraph Company, or its licensee, all the plant, fixtures, etc., now belonging to or in use for district or exchange purposes in the territory aforesaid, and turn over the same to said Maynard or his assigns and legal representatives at the cost price thereof, which, according to a statement made by said Western Union Telegraph Company, is less than $2,500, and said Maynard and his assigns agree to take the same from said National Bell Telephone Company and pay the cost price thereof, the same as may be paid to said Western Union Telegraph Company, or its licensee, by the said National Bell Telephone Company.

In case the proposed agreement between the National Bell Telephone Company and the said Western Union Telegraph Company and associates is not executed and carried out within sixty days from the date hereof, then this agreement shall be null and void.

In witness whereof, the parties to these presents have hereunto set their hands and seals this twenty-eighth day of October, 1879.

THE NATIONAL BELL TELEPHONE CO.

By its General Manager, THEO. N. VAIL.
GEO. S. BRADLEY, *Vice-President.*
GEO. C. MAYNARD.

In presence of—
O. E. MADDEN.

THE NATIONAL TELEPHONE EXCHANGE,

Per GEO. C. MAYNARD.

38 U. S. Patent Office. Rec. for record Nov. 29, '79. Recorded Liber 824, p. 153.

This agreement, made this ninth day of June, A. D. 1881, by and between George C. Maynard, of the first part, and Henry D. Cook, junior, of the second part, both of the city of Washington, in the District of Columbia, witnesseth:

That the said party of the first part for and in consideration of the agreements of the said party of the second part herein contained, and of the sum of dollars to him in hand paid by the said party of the second part, the receipt whereof is here-

by acknowledged, has sold, assigned, and transferred, and by these presents does sell, assign, and transfer, unto the said party of the second part, his executors, administrators, and assigns, all of his right, title, interest and privileges as agent and licensee of the American Telephone Company, under and by virtue of the contract of April 22nd, 1878, between the party of the first part and Gardiner G. Hubbard, trustee, the contract of December 2nd, 1878, between the party of the first part and the Bell Telephone Company, and the contract of October 28th, 1879, between the party of the first part and the National Bell Telephone Company, within the Territory covered by said contracts.

And the said party of the first part for and in consideration of the sum, above named, has sold, assigned and conveyed, and by these presents does sell, assign and convey, unto the said party of the second part, his executors, administrators, and assigns, all the poles, wires, batteries, instruments, and appurtenances described in the schedule hereunto annexed, and
39 his rights of way relating thereto; and all his right, title, and interest in every lease and contract now in force heretofore made by him with the lessees of telephones and other instruments covered by said contracts, including lessees of telephone lines owned by the party of the first part, and also agrees to turn over to the party of the second part all contracts and leases with such lessees as are now in his possession.

Provided however, That the parties hereto expressly except from the operation of this agreement so much of the interest of said party of the first part under said several contracts as relates to the telephone exchange business in the District of Columbia which has already been transferred to the National Capital Telephone Company by an instrument dated December 1st, 1879, which instrument is referred to and made part hereof.

* * *

And the party of the second part agrees to take the place of the party of the first part as agent and licensee of the American Bell Telephone Company under said contracts of date April 22nd, 1878, December 2nd, 1878, and October 28th, 1879, as modified by the acceptance by that company of the National Capital Telephone Company as its agent in matters pertaining to the exchange telephone business in the District of Columbia.

A schedule giving the location of telephones included in this transfer is hereto annexed, which schedule contains also a short statement of the terms under which said telephones are held by those in whose possession they now are.

In witness whereof the said parties of the first and second parts have hereunto set their hands and seals on the day and year first above written.

GEO. C. MAYNARD, [SEAL.]
HENRY D. COOKE, JR., [SEAL.]

Signed, sealed, and delivered by both parties in the presence of—

CHAS. P. WILLIAMS.

* * *

Contract for Exchange.

(Form 109 D.)

This agreement, made this thirty-first day of March, A. D. 1883, by and between the American Bell Telephone Company, a corporation created under the laws of the States of Massachusetts, lessor and licensor, party of the first part, and the National Capital Telephone Company, a corporation created under the laws of the State of West Virginia, lessee and licensee, party of the second part, witnesseth:

1. Whereas the lessor owns the letters patent of the United States granted to Alexander Graham Bell, March 7, 1876, and January 30, 1877, numbered 174465, 186787, respectively, and owns, or has the right to use, and may hereafter own or have the right to use, sundry other inventions, which are or may be embodied in electric speaking telephones, and desires to extend the use of telephones licensed by it in every manner in
41 which the public may wish to use the same, and for that purpose to provide for the construction and use of the apparatus and lines necessary to be used in connection therewith; and whereas the lessee desires to obtain the use of telephones under lease and license from the party of the first part to be used with the lines of telephonic district or exchange systems established and owned by it in the territory hereinafter described under the provisions hereinafter set forth: Now, it is agreed as follows:

2. The rights hereby granted shall be perpetual unless determined as hereinafter provided, and shall extend to all exchanges established and owned by the licensee and wholly within the following described territory, namely, the District of Columbia.

* * *

4. The licensor, at its special office or factory, will deliver to the second party as needed electric speaking telephones, made and to be used under its patnts during the existence of the rights hereby granted and as herein set forth and permitted; and all telephones delivered to the second party during the continuance hereof shall be deemed to be furnished hereunder un-

less otherwise specially designated by the licensor. They will be of such character and pattern and bear such marks as the lessor shall from time to time determine, but the second party may choose from among such standard patterns. Each of said telephones shall remain the property of the licensor, and is hereby leased and the use of it licensed under such pat-
42 ents and all others under which the lessor has or may have a right to license, so far as applicable thereto, for the purposes herein declared, for the term of one year from the day when rent and royalty begin to accrue on it as provided in article 8; but the due payment thereof to the licensor and the due performance of the stipulations hereof during said year by the second party and those using the telephone under it shall ipso facto operate to renew the lease and the license for another year, and so on until the expiration or other determination hereof.

* * *

5. The lessor will license, to be used with such telephones, the inventions in call bells, switches, switch boards, and other apparatus needed for such telephone lines which it can so license, upon such royalties as it may from time to time establish, not greater than those fixed for others under similar circumstances, but such call bells, switches, switchboards and other apparatus shall be used only with telephones licensed by the lessor, and the second party agrees not to use them otherwise nor to dispose of them to anyone except those so licensed or to the licensed manufacturers of the lessor.

The second party may enjoy any rights of way and similar franchises to maintain said lines which the lessor can permit it to use when and so long as, in the judgment of the lessor, it shall not interfere with the lessor's enjoyment thereof, and shall pay whatever may be due to third persons, if anything, growing out of or in connection with such use by it for trunk lines from the several exchange offices to points outside of the respective exchange districts and telegraph offices.

43 ——— The lessor, may, without further compensation, enjoy all rights of the licensee to erect and maintain lines and may use its poles and fixtures, but shall pay a pro rata share of the cost of erecting and maintaining them.

6. The lessee admits the validity of all patents relating to telephony, and telephonic appliances now or her-eafter held by the licensor or under which it may hold licenses exclusive in their character, and the validity of its title thereto, and will not dispute the same, nor make, use, or be interested in any telephones or telephonic lines or business not licensed by the licensor or its assigns.

* * *

8. The second party shall charge subscribers to its exchanges such rental and royalty for the telephones as the licensor may fix from time to time for these and other like exchanges, and also in addition a sum not exorbitant nor unusual for the use of call bells, batteries, wires, and other appliances, and for services furnished or performed, and may collect both of said sums for a period not exceeding one year in advance. It will make such reports, giving such information regarding the operations of its exchanges and the prices charged as the licensor may from time to time request. It shall pay to the licensor a rental and royalty at the rate per instrument of sixty (60) per cent of the telephone rental and royalty fixed as above being a discount of forty (40) per cent, to commence on each telephone on the first day of the second calendar month after its
44 shipment by the licensor, to continue the instrument shall be put into the possession of the licensor or proved to be destroyed, and to be paid in equal monthly payments in advance at the licensor's office on the tenth day of each month up to the last day of the same month. Until otherwise fixed, the rates shall be as follows:

Battery transmitter, each instrument per year..... $10.00
Magno-telephone, each instrument..... 10.00

* * *

The second party will not, without special leave of the licensor, so far as it can lawfully prevent it, permit the transmission over such connecting lines of general business messages, market quotations, or news for sale or publication, nor any communications in behalf of other parties than those who directly communicate by the telephone by themselves or their servants, or agents personally present at the instruments, and no person engaged in the business of transmitting messages for other parties shall be authorized or knowingly allowed by the second party to transmit such messages over such lines.

* * *

10. If the second party shall fail to pay any sums due hereunder for thirty days after the same shall become payable, or shall violate any other terms or conditions of this contract, and shall persist in such default, violation, or neglect, or fail to remedy or repair the same for sixty days after written notice thereof from the licensor, or shall become bankrupt or insolvent, the licensor may, if it shall so elect, by written notice to the second party (or those in charge of any of its offices), terminate all rights granted by the licensor hereunder, and
45 thereupon may, by its agents, sever the circuit on which any telephone is placed and take possession of and re-

move the telephone, and for that purpose may enter the premises of second party and all persons claiming under it.

* * *

THE AMERICAN BELL TELEPHONE CO.

By its General Manager, THEO. N. VAIL. [SEAL.]

Approved: W. H. FORBES, *President.*

NATIONAL CAPITAL TELEPHONE COMPANY.

By its President, A. P. SAWYER. [SEAL.]

Supply of Telephones for Private Lines and Other Purposes.

(Form 116 C.)

This agreement, by and between the American Bell Telephone Company, of Boston, Massachusetts, a corporation, established under the laws of said State, lessor and licensor, of the first part, and the National Capital Telephone Company, a corporation, created under the laws of the State of West Virginia, of the second part, witnesseth:

1. Whereas the lessor owns the patents of the United States granted to Alexander Graham Bell, March 7, 1876, and January 30, 1877, numbered 174465 and 186787, respectively, and owns or has the right to use, and may hereafter own or have the right to use, sundry other inventions, which are or may be embodied in electric speaking telephones, now, for the purpose of supplying and placing telephones to be used for the
46 purposes and as hereinafter set forth, upon private lines, club lines, social lines, and lines for speaking tube purposes, which are entirely within the following described territory, viz: the District of Columbia, it is agreed:

2. The private line referred to in this contract is a line consisting of only a single circuit, which shall not be permanently nor temporarily connected with any other circuit, and the telephones on which shall be used only for the individual and private business of the lessees, and only by them and their employees; and which line shall not extend more than twenty-five miles beyond the municipal limits of the city or town in which one end of the line is situated, and which shall not be used for more than four individuals, firms, or corporations, and which shall not have more than eight stations, and upon which no business shall be transacted for any consideration or toll
47 to be paid by other persons than the lessees, or other parties named in the lease of telephones, not exceeding

said number, and over which shall be transmitted no business messages, market quotations, or news for sale or publication, or messages in respect of which, or of the transmission, collection, delivery, publication, sale, or use of which, any consideration or toll is to be paid by any other person.

3. A club line is a line consisting of only a single circuit, connecting not less than five individuals, firms or corporations, without regard to the number of stations, or having not less than nine stations, without regard to the number of parties connected, all the stations of which are within the same municipality, or within five miles of its principal post-office, and which is used by not more than one party at each station. In other respects the use is limited as above stated for private lines.

4. A social line is a line consisting of a single circuit only, which shall not be permanently or temporarily connected with any other circuit, all the stations of which are within the same municipality and the telephones on which are to be used only for connecting persons and families for social and household purposes, and by not more than one party at each station.

* * *

5. Speaking-tube telephones are telephones of the kind especialy constructed and designated for that purpose, and which are allowed to be used only to connect stations, all of which shall be on the same premises of one individual, firm, or corporation, without passing over the land of any other per-
48 son (except a road or water course); or they may be allowed to be used for connecting a licensee's house, stable, and other domestic or farm buildings by passing over intervening land, provided that all stations connected by a speaking-tube line are to be within one circle of less than half a mile diameter.

* * *

7. The licensor, at its general office or factory, will from time to time deliver to the second party as needed, but not exclusively electric speaking telephones, during the existence of this contract, to be used upon such lines for such purposes; they shall be of such standard character and pattern, and bear such marks as the licensor shall from time to time determine, but the second party may select which it prefers among said patterns, (except for speaking-tube purposes as aforesaid); and licensor will also license, to be used with such telephones, the inventions in call bells, switches, and other apparatus needed for such telephone lines, which it can so license, upon such royalties as it may from time to time establish, not greater than those fixed for others under similar circumstances; but such call bells, switches, and other apparatus shall be used only with telephones licensed by the lessor, and shall not be disposed of to anyone except those so licensed or to the licensed manufactur-

ers of the lessor. Each telephone shall remain the property of the licensor, and may be used by suitable customers to be selected by the second party upon such lines for the purposes herein set forth, under lease and license from the licensor and lessor to such customers, such lease and license to be furnished by it for each customer, in such forms and upon such terms, conditions, and rental, and for such periods as the licensor may from time to time determine; each lease and license to be countersigned by the said second party, and to be signed by each customer upon whose premises telephones are to be.

* * *

8. The party of the second part shall pay, or cause to be paid, to the licensor a rental and royalty at the rate per instrument of the following percentages of the telephone rental and royalty fixed by the licensor in accordance with this contract:

Telephones for private lines, sixty (60) per cent (being a discount of forty (40) per cent); telephones for club lines, sixty (60) per cent (being a discount of forty (40) per cent); telephones for social lines, sixty (60) per cent (being a discount of forty (40) per cent); telephones for speaking-tube lines sixty (60) per cent, (being a discount of forty (40) per cent); to commence on each telephone on the first day of the second calendar month after its shipment by the licensor, to continue until the instrument shall be put into the possession of the licensor or proved to be destroyed, and to be paid in equal monthly payments in advance at the licensor's office on the tenth day of each month, up to the last day of the same month. Until otherwise fixed the rates shall be as follows:

For private lines:

Battery transmitter, each instrument per year.. $10.00
Magneto-telephone, each instrument per year..... 10.00

For club lines:

$10.00 per year for each battery transmitter, and $10.00 per year for each magneto telephone, where only one instrument is used [*as*]* at a terminal or station; where a pair of instruments, composed of a battery transmitter and a magneto-telephone, are used at one terminal or station, $15.00 per year for each pair so used.

For social lines:

Battery transmitter, each instrument per year..... $7.50
Magneto-telephone, each instrument per year..... 7.50

*Word in brackets erased in copy.

For speaking-tube purposes;
Speaking-tube telephone, each.....5,000 for 1 year
Speaking-tube transmitter, each.....5,000 for 1 year

* * *

10. The second party admits the validity of all patents relating to telephony and telephonic appliances now or hereafter held by the licensor, or under which it may hold licenses exclusive in their character, and the validity of its title thereto, and will not make, use, or be interested in any telephones or telephonic lines or business not licensed by the licensor or its assigns.

11. The second party shall, without charge, promptly notify the lessor of any parties using telephones not leased by the second party or the American Bell Telephone Company,
51 giving name of party, description of instrument, and place where same is used, and any other information possible to obtain.

* * *

Signed in duplicate this thirty-first day of March, 1883.

THE AMERICAN BELL TELEPHONE CO.

By its General Manager, THEO. N. VAIL. [SEAL.]
Approved: W. H. FORBES, *President.*

NATIONAL CAPITAL TELEPHONE COMPANY.

By its President, A. P. SAWYER. [SEAL.]

Whereas it was voted by the stockholders of the National Capital Telephone Company at a meeting duly called on June 29th, 1883, to sell and transfer said company, with all its rights, titles, property, and franchises, to the Chesapeake and Potomac Telephone Company on terms and conditions then stated: Now, therefore, this agreement witnesseth, that I, H. P. Frost, vice-president of the said National Capital Telephone Company (A. P. Sawyer, president, being disqualified by reason of ceasing to be a stockholder), by virtue of the vote of said company and by order of the board of trustees, in consideration of five dollars to me in hand paid, the receipt whereof is duly acknowledged, and of seven thousand five hundred (7,500) shares of stock of the Chesapeake and Potomac Telephone Company to me delivered, the receipt whereof is duly acknowledged by and from H. D. Cooke, treasurer of the said Chesapeake and Potomac
52 Telephone Company, have sold, and by these presents and this agreement do sell, assign, set over, and deliver to the said Chesapeake and Potomac Telephone Company, all the rights, titles, interests, property, credit, moneys, accounts, and franchises of whatsoever kind and nature, however owned,

held, or enjoyed and wherever, situated to have and to hold the same to the said Chesapeake and Potomac Telephone Company, their successors and assigns, to their use and benefit forever.

In witness whereof I hereunto set my hand and the seal of the said National Capital Telephone Co., this 30th day of July, 1883.

NATIONAL CAPITAL TELEPHONE COMPANY.
By H. P. FROST, *Acting President.* [SEAL]

Witness:
H. S. CUMMINGS.
JNO. A. BEAVER.

Received this 30th day of July, 1883, the property above described for the use and benefit of the Chesapeake and Potomac Telephone Company.
H. D. COOKE,
Treasurer, Chesapeake & Potomac Tel. Co.

This memorandum of an agreement, made this first day of August, A. D. 1883, by and between The American Bell Telephone Company, a corporation formed under the laws of the Commonwealth of Massachusetts, of the first part, The Chesapeake and Potomac Telephone Company, a corporation formed under the laws of the State of New York, of the second part, the National Capital Telephone Company, a body cor-
53 porate formed under the laws of the State of West Virginia, of the third part, and the "Telephone Exchange Company" (of Maryland), a corporation formed under the laws of said State of West Virginia, of the fourth part, witnesseth:

Whereas the said National Capital Telephone Company holds the following-named license agreements under the said The American Bell Telephone Company, viz:

Contract for exchanges, form 109 D, dated March 31, 1883;

Contract for supply of telephones for private lines and other purposes, form 116 C, dated March 31, 1883;

Contract for extraterritorial connecting lines from Washington, District of Columbia, to Laurel, in the State of Maryland form 113 C, dated March 31, 1883;

And whereas the said The American Bell Telephone Company and the said Telephone Exchange Company did, on the twenty-third day of May, A. D. 1882, enter into an agreement, a copy whereof is here-to annexed marked "B" and did in pursuance thereof execute the license contracts thereby called for; and

Whereas the said The Chesapeake and Potomac Telephone Company has been formed for the purpose of acquiring the property and consolidating the business of said National Capi-

tal Telephone Company, and said Telephone Exchange Company, and has acquired or bargained to acquire said property and business, including the right, with the consent of said The American Bell Telephone Company, to have an assignment of said agreements and licenses, and desires to have an assignment of said agreements and licenses, and to have the consent of the said The American Bell Telephone Company thereto:

54 Now, therefore, in consideration of the premises and of the covenants on the part of the several parties hereinafter contained—

1. Said National Capital Telephone Company hereby assigns, transfers, and sets over unto said The Chesapeake and Potomac Telephone Company all and singular said contracts as aforesid held by it and all its right in, to, and under the same, subject, however, to all acts, duties, covenants, conditions and agreements therein contained on its part to be done, kept and performed, and to all and singular the right of the said The American Bell Telephone Company therein contained.

Said The Chesapeake and Potomac Telephone Company hereby accepts said assignment, and in consideration of the consent of the said The American Bell Telephone Company to said assignment promises and agrees to and with the said The American Bell Telephone Company to be bound by and subject to all and singular the terms and conditions of said agreement and licenses as to all things hereafter done or to be done with like effect as if it, said The Chesapeake and Potomac Telephone Company were named party of the second part thereto; the said The American Bell Telephone Company assents to said assignment; and the said The American Bell Telephone Company, The Chesapeake and Potomac Telephone Company, and said National Capital Telephone Company agree that the said National Capital Telephone Company shall no longer be subject to or entitled to the benefit of said license agreements.

* * *

55 Said The Chesapeake and Potomac Telephone Company hereby accepts said assignment, and, in consideration of the consent of the said The American Bell Telephone Company to said assignment, promises to agree to and with said The American Bell Telephone Company to be bound by and subject to all and singular the terms and conditions of said agreement and licenses as to all things, hereafter done or to be done with like effect as if it, the said The Chesapeake and Potomac Telephone Company, was named party of the second part thereto; the said The American Bell Telephone Company assents to said assignment; and the said The American Bell Telephone Company, The Chesapeake and Potomac Telephone Company, and Telephone Exchange Company agree that the said

Telephone Exchange Company shall no longer be liable thereunder nor entitled to the benefits thereof.

3. And whereas in said agreement of May 23rd, 1882, it was among other things provided that said The American Bell Telephone Company should be entitled to and have 35 per cent interest in all and singular the property, rights, business, and profits of the said Telephone Exchange Company, and for the accomplishment thereof should, in addition to the stock payment then presently to be made, be entitled to 35-100 part of any increase in the amount of the capital stock of said Telephone Exchange Company that might be made; and

Whereas it is intended and agreed that said The American Bell Telephone Company shall, in substitution for its said right in any increase of the capital stock of said Telephone Exchange Company, have 35-100 of three-fourths of any excess or increase in the capital of the said The Chesapeake and Potomac
56 Telephone Company above the amount of $2,400,000; and

Whereas the capital of said The Chesapeake and Potomac Telephone Company has been fixed at $2,650,000; now, said the Chesapeake and Potomac Telephone Company agrees that it will forthwith furnish and pay to said The American Bell Telephone Company 656 and 1-4 shares of its capital stock and further that it will furnish and pay to said The American Bell Telephone Company 35 per cent of three-fourths of each and every increase which may be made in its capital stock above said amount of $2,650,000 (two million six hundred and fifty thousand dollars) such stock so to be paid to be lawfully issued, full paid and not subject to any assessment or any contribution.

Said The American Bell Telephone Company agrees that it will release to said The Chesapeake and Potomac Telephone Company its claim on 40-100 of the stock received by it hereunder to dividends which shall be declared before April 1, 1886, out of actual net earnings.

In witness whereof the parties hereto have caused these presents to be signed by their proper officers, respectively, thereto

duly authorized, and their respective corporate seals to be hereto affixed, the day and year first above written.

THE AMERICAN BELL TELEPHONE CO.

By its General Manager, THEO. N. VAIL. [SEAL.]

Approved: CHARLES P. BOWDITCH,
Vice-President. [SEAL.]

THE CHESAPEAKE AND POTOMAC TELEPHONE CO.

By its President, MORRIS F. TYLER. [SEAL.]

THE TELEPHONE EXCHANGE COMPANY.

By its President, A. G. DAVIS. [SEAL.]

NATIONAL CAPITAL TELEPHONE COMPANY.

By its President, A. P. SAWYER. [SEAL.]

57 We have received of the Chesapeake and Potomac Telephone Company six hundred and twenty-six (626) shares out of the six hundred and fifty-six and one-quarter (656¼) shares to which we are presently entitled, leaving thirty and one quarter (30¼) shares due us to be paid out of the next increase in stock.

THE AMERICAN BELL TELEPHONE CO.

By THEO. N. VAIL.

* * *

This agreement, made this eleventh day of December A. D. 1884, by and between the American Bell Telephone Company, a corporation created under the laws of the State of Massachusetts, of the first part, and the Chesapeake and Potomac Telephone Company, a corporation created under the laws of the State of New York, of the second part, witnesseth:

Whereas the first part issued to the Telephone Exchange Company, a corporation created under the laws of the State of West Virginia, two (2) license contracts, both dated May 23rd, A. D. 1882, in forms 109 D for exchange purposes, and 116 C for private line purposes, respectively, for the following described territory, that is to say:

The State of Maryland, excepting a belt within a radius of ten (10) miles of the City of Washington, District of Columbia, and

Whereas the second party hereto has, by assignment, become party to said contracts in place of said Telephone Exchange Company; and

Whereas it is desired by the parties hereto to have said excepted territory brought under said two (2) contracts;

58 Now, therefore, it is agreed as follows: That said accepted territory, that is to say:

That portion of the State of Maryland as is within a radius of ten (10) miles of the City of Washington, District of Columbia, shall from the date hereof come under said two (2) license contracts, with like effect as if it were named in the descriptions of territory covered thereby (and had not been accepted therefrom) and said two (2) license contracts shall be read and construed throughout accordingly:

Signed in duplicate on the day first above written.

THE AMERICAN BELL TELEPHONE CO.

By its General Manager, THEO. N. VAIL. [SEAL.]

Approved: CHARLES P. BOWDITCH,
Vice-President.

THE CHESAPEAKE AND POTOMAC TELEPHONE CO.

By its President, MORRIS F. TYLER [SEAL.]
GEO. M. WOOD, *Secretary.*

Contract for Extraterritorial Connecting Lines.

(Form 113 C.)

This agreement, made this seventh day of February, A. D. 1885, by and between the American Bell Telephone Company, a corporation duly formed under the laws of Massachusetts, lessor and licensor, of the first part, and the Chesapeake and Potomac Telephone Company, a corporation created under the laws of the State of New York, lessee and licensee, of the second part, witnesseth:

59 1. Said licensee desires to obtain the right to use upon lines between Washington, in the District of Columbia, and Baltimore, in the State of Maryland, upon the most direct route, telephones to be obtained from the lessor and under lease and license from it, under its two patents granted Alexander Graham Bell, Nos. 174,465, dated March 7, 1876, and 186,787, dated January 30, 1877, and under other patents which it may hereafter own or have the right to use applicable thereto; and also to avail itself of and enjoy the right of connecting with the

exchange system already established in any of said places, as provided and stipulated in favor of the lessor, in its exchange contracts, for those places (copies of which stipulations have been furnished to the licensee, and the terms of which he is to conform to so far as they relate to business to be done hereunder), and of connecting with exchange systems which may hereafter be established in any of said places or in exchange districts lying on the direct route between said places, under contracts to be made by the lessor therefor, to contain stipulations substantially like those in the lessor's Standard Form 109 C, a copy of which has been furnished to the lessee, and wishes to use, and allow others to use, said lines for personal communication between said termini and said other places; now it is agreed:

The rights hereby granted to the lesse shall be perpetual unless determined as hereinafter provided.

3. The lessee may construct lines along said described route, and may use them for telephonic personal communications between a customer in one exchange district or above-
60 named place and a customer in another such exchange district or place, and not otherwise, except in connection with extra-route lines owned or specially licensed for the purpose by the licensor.

* * *

4. The licensor, at its general office or factory, will deliver to the lessee as called for electric speaking telephones made and to be used under its patents during the existence of the rights hereby granted, and as herein set forth and permitted, and all telephones delivered to the lessee during the continuance hereof shall be deemed to be furnished hereunder unless otherwise specially designated by the licensor. They will be of such character and pattern and bear such marks as the lessor shall from time to time determine, but the lessee may choose from among such standard patterns. Each of said telephones shall remain the property of the licensor, and is hereby leased and the use of it is hereby licensed for the purposes herein declared, for the term of one year from the day when rent and royalty begins to accrue on it as herein provided; but the due payment thereof to the licensor, and the due performance of the stipulations hereof during said year by the lessee, and those using the telephone under it, shall ipso facto operate to renew the lease and license for another year, and so on until the determination hereof. The licensee shall pay to the licensor a rental and royalty at the rates named below, to commence on each instrument on the first day of the second calendar month after its shipment by the licensor, to continue until the instru-
61 ment shall be put into possession of the licensor or proved to be destroyed, and to be paid in equal monthly

payments in advance at the licensor's office on the tenth day of each month up to the last day of the same month. Until otherwise fixed the rates shall be as follows:

Battery transmitter, each instrument per year.....	$10.00
Magneto-telephone, each instrument per year.....	10.00

* * *

6. The lessor will license to be used with such telephones the inventions in call bells, switches, switchboards, and other apparatus needed for such telephone lines, which it can so license, upon such royalties as it may from time to time establish; not greater than those fixed for others under similar circumstances; but such call bells, switches, switch boards, and other apparatus shall be used only with telephones licensed by the lessor, and the lessee agrees not to use them otherwise, nor to dispose of them to anyone except those so licensed, or to the licensed manufacturers of the lessor. The licensee may enjoy any rights of way and similar franchises to maintain said lines which the lessor can permit him to use when and so long as, in the judgment of the lessor, it shall not interfere with the enjoyment thereof by the lessor or its other grantees, and shall pay whatever may be due to third persons, if anything, growing out of or in connection with such use by it.

* * *

62 8. The lesse will pay to the exchanges established, or which may hereafter be established and with which it shall connect as aforesaid, such sums as such exchanges are or shall be entitled to receive under their exchange contracts made, or to be made, for making connections with extraterritorial lines. And the lessee will also pay to the lessor, in addition to said telephone rental and royalty, and in consideration of the further rights and privileges hereby granted, one-fourth of the lessee's gross receipts from subscriptions and tolls (which tolls shall not be less than at the rate of fifteen cents for the first ten miles or fraction thereof, and five cents for each additional ten miles or fraction thereof, for a communication occupying not more than five minutes), and from other sources, after deducting for terminal expenses such sums as it may have to pay to the terminal exchange, not exceeding those chargeable under exchange contracts made or to be made by the licensor as aforesaid. Said payments are to be made to the lessor at its office on the tenth day of each month, upon all receipts up to the first day thereof. The lessee shall keep full accounts of such receipts and payments, furnish copies thereof to the licensor upon request, and exhibit its original accounts and vouchers, so far as may be proper to verify the same.

9. The lessor may place the telephones furnished hereunder in its own offices for use by general customers, as herein stated and limited or may place them under sub-leases and licenses in connection with its lines, on the premises of subscribers or special customers, for such uses. Such subleases and licenses shall, in such form as the licensor shall from time to time
63 approve, express the title of the licensor to the telephone and the patents, the extent of the license hereby granted, the purposes for which the telephone may be used, that any other use of any telephone by any person, or non-payment of the rental and royalty to the licensor, is an injury to and invasion of its rights as owner thereof, and of the patent rights used therein and thereby, and entitling it to all rights and remedies in law and in equity under the patent laws, as herein expressed, otherwise, including the remedy by injunction against the person in possession thereof, and all others who have misused the same, as aforesaid, for any use not justified by a subsisting license, or for the violation of any other of its rights. It may also enforce against such sublicense all rights and pursue all remedies given by and under such sublicense, and may use the name of the lessee for such purpose, or may require the lesse, at his own expense, to enforce the terms of such contracts.

10. If the lessee shall fail to make any of the payments herein stipulated when due, or shall fail to keep any of the terms hereof, or of a certain agreement between the parties hereto, dated August 1st, 1883, and such default shall continue during a period of sixty days after written notice thereof from the lessor, or shall become bankrupt or insolvent, the licensor may, if it shall so elect, by a written notice to the lessee (or those in charge of any of its principal offices), terminate all rights granted by the licensor hereunder, and by itself or those designated by it for the purpose, by due process of law or by actual entry, and may and shall be entitled to repossess itself of the rights and privileges herein granted, and thereafter use and enjoy the same.

64 The lessor also reserves all its rights and remedies in law and in equity under the patent laws or otherwise, including the remedy by injunction against the lessee or those claiming under it, for the use of any of its patented inventions or instruments not justified by a subsisting license hereunder, or for the violation of any other of its rights.

Signed on the day first above written, in duplicate.

THE AMERICAN BELL TELEPHONE CO.

By its General Manager, THEO. N. VAIL. [SEAL.]

Approved: CHARLES P. BOWDITCH,
Vice-President.

THE CHESAPEAKE AND POTOMAC TELEPHONE CO.

By its President, MORRIS F. TYLER. [SEAL.]

Attest: GEO. M. WOOD, *Secretary.*

65 *Memoranda.*

For Defendants' Exhibit No. 3, See Defendants' Testimony, page 189.

For Defendants' Exhibit No. 4, See Defendants' Testimony, page 190.

66 EXHIBIT "No. 5."

Mortgage.

This indenture, made this first day of June, in the year of our Lord one thousand eight hundred and ninety-one, by and between The Chesapeake and Potomac Telephone Company, a corporation duly organized and existing under the laws of the State of New York, hereinafter called the Telephone Company, party of the first part, and the American Security and Trust Company, a corporation duly organized and existing under an Act of Congress approved October first, 1890, Trustee, hereinafter called the Trust Company, party of the second part: Witnesseth that:

Whereas, the said party of the first part is engaged in constructing, maintaining and operating telephone lines and connections in the District of Columbia and in the State of Maryland, and has found it necessary to borrow money for the purpose of extending, improving, perfecting, constructing, maintaining and operating the said Company's lines of electric communication and the equipments and appurtenances, and for the purpose of improving and increasing the said Company's facilities for business generally, and for the purpose of paying off its floating indebtedness and for the said Company's use for such other lawful purposes as shall be, by the Board of Directors di-

rected or authorized from time to time, and is about to issue its bonds for the purpose of providing for the payment of its floating indebtedness, and to creat a mortgage to secure the payment of such bonds and of interest thereon; and

67 Whereas, to that end, the stockholders of said the party of the first part, in accordance with law, have duly authorized, and the Board of Directors of said the party of the first part has duly directed, the issue of a series of six hundred bonds, of one thousand dollars each, and numbered from 1 to 600, inclusive, sealed with its corporate seal, attested by its Secretary, and duly authenticated by the certificate of the Trustee hereunder, and having interest coupons thereto attached with the name of the Treasurer engraved thereon, in fac-simile of his signature, which bonds, coupons and certificates are to be in the form following, respectively, the same having been approved by the said stock-holders, as required by law:

* * *

And whereas, the execution and delivery of this mortgage has been duly authorized by the stockholders of the party of the first part in accordance with law, and has been duly directed by the Board of Directors of said party, to secure the payment of said bonds and of the interest thereon.

Now, therefore, this indenture witnesseth, that said the party of the first part, in consideration of the premises, and of the sum of one dollar to it in hand duly paid by the said party hereto of the second part, at or before the ensealing and delivery of these presents, the receipt whereof is hereby acknowledged, in order to secure the payment of the principal and interest of the bonds aforesaid, has granted, bargained sold, aliened, remised, released, conveyed and confirmed, assigned, transferred

68 and set over, and by these presents does grant, bargain, sell, alien, remise, release, convey and confirm, assign transfer and set over, unto the said party hereto of the second part, its successor and successors in the trust, and their heirs and assigns forever.

All and singular the real estate of party of the first part situated in the cities of Washington and Baltimore, heretofore acquired, and all the real estate which may hereafter be acquired in the District of Columbia, and in the State of Maryland; all and singular the rights, privileges and franchises of party of the first part, heretofore acquired or which may hereafter be acquired and to be exercised and enjoyed in the District of Columbia and the State of Maryland, including all patent rights and licenses under patents in so far as the same are to be there exercised and enjoyed; all and singular the plant, apparatus, furniture and fixtures and all other property of a personal or mixed nature heretofore acquired or which may hereafter be acquired, together with the good will of the party

of the first part in said the District of Columbia and the State of Maryland, including all and singular its lines of electric communication in said territory constructed or to be constructed, and as the same are now or hereafter may be located, and whether now acquired or hereafter acquired, in so far as the same are to be exercised or enjoyed within said the District of Columbia and the State of Maryland.

* * *

69 It is further covenanted and agreed by the Telephone Company that said Company, party hereto of the first part, shall and will create a Sinking Fund for the purchase or payment of the bonds hereby secured, by setting aside for and paying to the Trustee, party hereto of the second part, semi-annually, on the fifteenth day of January and the fifteenth day of July in each and every year, commencing January 1, 1893, a sum of money equal in amount to two and one-half percentum of so much of the said six hundred thousand dollars as may be issued and then outstanding, being at the rate of five per centum per annum, payable semi-annually as aforesaid. The Trustee shall and will, if and when by the Telephone Company directed so to do, invest the then amount of the fund created by the sums so set aside and paid in, and the accumulations thereof, in such securities or property as shall be satisfactory to the Telephone Company. Any securities or property which shall be so purchased with any of the moneys so set aside for and paid into such Sinking Fund, or with the accumulations thereof, shall come under and be subject to the lien of this mortgage, and shall by the Trustee be held for and applied to the purposes of the trust hereby created. The Telephone Company further covenants and agrees to reimburse the Trustee, on demand, the amount of the reasonable expenses at any time incurred and paid by the Trustee, in the matter of investing moneys of the Sinking Fund in any securities or property and holding the same.

70 In testimony whereof, the party hereto of the first part has caused its corporate seal to be hereunto affixed, and to a duplicate hereof, both of which shall be originals, attested by its Secretary, and these presents to be signed by its President; and the party hereto of the second part, in token of its acceptance of the trusts hereby created, has caused its corporate seal to be hereunto affixed, attested by its Secretary, and these

Presents to be signed by its President the day and year first herein written.

THE CHESAPEAKE AND POTOMAC TELEPHONE CO.

By SAMUEL M. BRYAN, *President.* [SEAL.]

Attest:
CHAS. G. BEEBE, *Secretary.*

AMERICAN SECURITY AND TRUST COMPANY,

By A. T. BRITTON, *President.* [SEAL.]

Attest:
GEO. E. EMMONS, *Secretary.*

71 DISTRICT OF COLUMBIA, City of Washington, *ss:*

On this 1st day of June, in the year one thousand eight hundred and ninety-one, before me, Horace W. Upperman, a Notary Public, in and for the said city aforesaid, personally came Charles G. Beebe, to me known and known to me to be the Secretary of the Chesapeake and Potomac Telephone Company, the corporation of that name mentioned and described in the foregoing mortgage or deed of trust, and which executed the same as party of the first part thereto, who being by me duly sworn, did depose and say: That he resides in the City of Washington, District of Columbia; that he is the Secretary of the said The Chesapeake and Potomac Telephone Company, and knows the corporate seal thereof; that the seal affixed to the foregoing mortgage or deed of trust, is the corporate seal of said Company, and was affixed thereto by order of the Board of Directors of the said Company, and that he signed his name thereto, by the like order, as Secretary of said Company.

And the deponent further said that he is acquainted with Samuel M. Bryan, and knows him to be the President of said Company; that the signature of the said Samuel M. Bryan subscribed to the foregoing mortgage or deed of trust, is the genuine handwriting of the said Samuel M. Bryan, and was thereto subscribed by the like order of the said Board of Directors, and in the presence of said deponent.

Witness my hand and seal of office the day and year last above written.

HORACE W. UPPERMAN,
[SEAL.] *Notary Public.*

72 DISTRICT OF COLUMBIA, City of Washington, *ss:*

Be it remembered, that on the first day of June, A. D. 1891, before me, the subscriber, a Notary Public, personally ap-

peared George E. Emmons, who, being duly affirmed according to law, deposed and said that he is the Secretary of the American Security and Trust Company, the corporation named in the above and foregoing indenture; that he was personally present at the execution of the acceptance of the trust in said indenture, and saw the corporate seal of the said Company affixed thereto; that Alexander T. Britton, the President of the said Company, did then sign, seal and deliver the said indenture as his act and deed, and as the act and deed of the said Company, by virtue of the authority vested in him as such President; that the seal so affixed is the common or corporate seal of the said Company; that he, the deponent, at the same time signed his name to the said indenture as a subscribing witness thereto, and as said Secretary in attestation of the due execution and delivery thereof; and the names of the said President and of this deponent, subscribed to the said indenture as aforesaid, are of their own proper and respective handwriting.

GEO. E. EMMONS,
Secretary.

Affirmed and subscribed before me, the day and year first aforesaid. Witness my hand and notarial seal.

HORACE W. UPPERMAN,
[SEAL.] *Notary Public, D. C.*

73 EXHIBIT "No. 6."

Report of the Telephone Commission of Maryland appointed under act of the General Assembly, approved April 3, 1894, to ascertain the cost of, and proper rates for, furnishing telephone service in the State of Maryland.

73*a* BALTIMORE, January 6th, 1896.

To the Honorable the General Assembly of Maryland:—

By virtue of Section G which, by Act of the Assembly of Maryland of 1894, Chapter 207, was added to Article 23 of the Maryland Code, the Governor, in February, 1895, appointed the undersigned the Telephone Commissioners mentioned in said section.

By reference to the Section 232 G, it will be seen that the Commissioners were directed by an investigation conducted as therein mentioned, to ascertain,—

(*a*) The amount expended by the Chesapeake and Potomac Telephone Company or the Chesapeake and Potomac Telephone Company of Baltimore City, in the acquisition of the rights of way and other easements now held by either of the said Companies in the State of Maryland.

(*b*) The amount expended in the construction of plant, equipment and works now owned by them or either of them, and used in connection with the Telephone business in the State of Maryland.

(*c*) The cost of furnishing in the City of Baltimore, and other places in the State of Maryland, telephone service, both that known as the ordinary or Grounded service and that known as the Metallic Circuit service.

The Commissioners were also directed to procure all such other information which in their judgment should be necessary and proper to determine what ought to be fair and sufficient rates for furnishing telephone service in the City of Baltimore, and in other places in the State of Maryland.

For the purpose of discharging these duties the Commissioners were authorized to make the fullest use needed for the purpose of all the books, papers and accounts of the Telephone Company; and, if necessary to examine the officers and
73*b* agents of the Companies and other persons, and also to employ an expert accountant to assist them in the discharge of the duties imposed on them. The Commissioners appointed Colonel John A. Tompkins, of the City of Baltimore, to take charge of this examination.

Upon his appointment, Colonel Tompkins was instructed by the Commissioners to make a careful and thorough examination, to ascertain the matters above referred to under (*a*), (*b*), and (*c*); also to procure such other information as was available, bearing on the question of what ought to be fair and sufficient rates for furnishing the two kinds of telephone service mentioned in Section 232 G; and to report the facts ascertained by him, to the Commissioners, for their information and guidance. He was also requested, by the Commissioners, to include in his report such conclusions as seemed to him warranted by the facts and information reported by him, and any suggestions which seemed to him proper in connection with the subject matter of his investigation.

The Commissioners received from Colonel Tompkins in December last a very clear, full and comprehensive report, showing the result of his examination and investigation, together with tabulated statements, showing in detail the basis of his report, and also included in his report are the conclusions reached by him and such suggestions as seemed to him reasonable and proper.

By the concluding clause of Section 232 G, it is made the duty of the Commissioners to report to your Honorable Body, the result of the investigation and examination made by them, together with any recommendations they may think proper to make upon the subject matter thereof.

In performance of this duty, the undersigned respectfully make this, their report, and as part thereof they annex thereto the above-mentioned report of Colonel Tompkins, together with the Exhibits A, B, C and D therein mentioned and respectfully state:

1. That in their judgment the charges now made by the Chesapeake and Potomac Telephone Company for telephone service in the City of Baltimore are as low as can be reasonably asked for by subscribers; and in view of the facts shown by the
73c report of Colonel Tompkins, cannot be reduced without doing injustice to the Company nor without impairment of the service to those who use it.

2. The undersigned agree with the opinion expressed by Colonel Tompkins in reference to the rates now chargeable for six months contracts.

3. They are further of opinion that the facts stated by Colonel Tompkins relative to "*Toll Service*" show clearly that the provisions of the Act of Assembly of 1892, Chapter 387, regulating this service should be modified, not only as an act of justice to the Company, but in order that other communities in Maryland which do not now have telephone service may be supplied therewith, and because also the existing law fixes a uniform rate for this service irrespective of the distance between points to be connected by telephone service, and under this law the Company can charge no more for the use of the telephone lines between a point as far distant from Baltimore, for instance, as Cumberland, than they can charge between Baltimore and Towson.

The undersigned respectfully state that the rates and the mode of adjustment thereof for this character of service, suggested in the report of Colonel Tompkins, and which it will be seen are based on the plan adopted in a number of other States, seem to us, reasonable and fair.

Having thus discharged the duties committed to them by the Act of Assembly of 1894, Chapter 207, Section 232 G, they respectfully submit this, their report, to the General Assembly of 1896.

JAS. L. McLANE,
JAS. A. GARY,
CHARLES GOLDSBOROUGH.

73d

OFFICE OF JOHN A. TOMPKINS,
301 NORTH CHARLES STREET,
BALTIMORE, December 9th, 1895.

To Messrs. Jas. L. McLane, James A. Gary, Charles Goldsborough, Telephone Commissioners.

Gentlemen: In accordance with the instructions of the Commission, I have made a careful and thorough examination of the

accounts of the Chesapeake and Potomac Telephone Company, and submit the following report of the results of the same.

The President of the Company, Mr. S. M. Bryan, placed all the books of account and vouchers at my disposal and I received every assistance and information possible from the officers and employes of the Company.

In order to obtain a fair average of the business and operations of the Company, my investigation covered the period from January 1st, 1891, to October 31st, 1895, practically five years. The accounts on the ledgers were verified by the original entries in the journals and cash books and the distribution of expenses and disbursements by examination of the vouchers upon which the payments were made. The system of accounting adopted by the Company is remarkably thorough, clear and scientific.

The telephone business in this State is conducted by the Chesapeake and Potomac Telephone Company, a New York corporation, which also controls the telephone business in the District of Columbia.

The Capital Stock of this Company is $2,650,000, of which stock $1,900,000 is represented by the Maryland and $750,000 by the District of Columbia properties and franchises.

The Chesapeake and Potomac Telephone Company of Baltimore City has a capital of $10,000, of which $9,750 is
73e owned by the Chesapeake and Potomac Telephone Company of New York.

On August 1st, 1883, the Chesapeake and Potomac Telephone Company of New York purchased the plant, franchises and business of the Telephone Exchange Company of Baltimore and the National Telephone Exchange Company of Washington. In payment for the Baltimore Company, there was issued $1,900,000 of full paid stock, of which the American Bell Telephone Company received $630,000 for franchises and the vendors of the Baltimore Company received $1,270,000. Of this latter stock, $100,000 was retained by Trustees for the benefit of the new Company and was disposed of as follows: $62,600 was given the American Bell Telephone Company for existing contracts and the balance, $37,400, sold for the sum of $24,546.67. The present Company received from the old Company, cash, accounts receivable and supplies valued at $45,045.24.

None of the books of account of the old Company are in possession of the present Company, nor is there any inventory of the plant taken over. The number of subscribers in Maryland on August 1st, 1883, was 1496. From the best information I can obtain from the Company, and from estimates made by Electrical Engineers conversant with telephone construction, I think a valuation of $300,000 as the cost of the plant taken over is a conservative one and probably within the actual outlay made by the original Company.

Since commencing operations the Chesapeake and Potomac Telephone Company has greatly extended and improved its plant. It early recognized the fact that to meet the requirements of increasing business and the demands of the public, poles suitable for carrying heavy copper wire must be substituted for the lighter ones upon which the iron wires were strung, and that in Baltimore overhead connection must give way to underground conduits and cables.

From 1885 to 1892 the Company expended in Aerial Construction, exclusive of maintenance of existing plant, the sum of $127,557.37. In 1889, it commenced putting its lines in Baltimore under ground and in three years expended $341,000 for conduits and cables and $41,500 for a new and improved switch board. To meet this outlay the Company was obliged to issue bonds to the amount of $400,000.

At present the Company has in this State 3,730 miles of wire on 333.25 miles of pole lines; 4,341 miles of wire in 39.6 miles of underground cables and 11.17 miles of underground conduits.

The substitution of underground cables for aerial construction and the changes entailed thereby in connecting the lines with the switch board made it imperative the Company should own the building in which its Exchange is located. The outlay involved in the erection of this building amounts to $132,600.

Upon inquiry, I find that in Boston, New York, and elsewhere, the Telephone Companies have felt it necessary to own the buildings in which their Exchanges are located.

Since August, 1883, the Company has expended for new plant	$643,281.26
For the building on St. Paul St., Baltimore	132,661.66
	$775,942.92
To this add estimated cost of plant taken over	300,000.00
Making total cost of plant	$1,075,942.92
Equal to a cost of $351.85 per subscriber.	
The net profits of the Company from August 1st, 1883, to January 1st, 1895, amount to	$951,689.22
Equal to 4⅜ per cent. per annum on the capital stock and 7¾ per cent. per annum on the cost of the plant.	
The dividends paid from August, '83, to January, '95, amount to	$649,411.20
Equal to 2.99 per cent. per annum on the capital stock and 5.29 per cent. per annum on the cost of the plant. During the past three years the company has paid but two per cent. per annum dividends.	

73*g* Prior to 1889 the Company did little in the way of reconstruction of its lines, confining its work to such repairs only as were necessary to keep the lines in working order. The original construction was poor and the plant rapidly deteriorated. Since 1889 the maintenance expense has greatly increased and considerable reconstruction has been required.

In order to ascertain the proper allowance for depreciation of plant—in determining the cost of service in Exhibit "A"—I obtained estimates from several of the larger telephone companies and from electrical engineers conversant with telephone construction. The amount allowed, 2.82 per cent., on cost of plant is, I think, a very conservative one and probably considerably below what will be found to be the actual depreciation. Electrolysis caused by currents from the trolley lines is already seriously affecting the cables, and the switchboard which the Company put in in 1890 at a cost of $41,500 is now being replaced by an improved one which will involve an outlay of nearly $75,000. The old board then becomes obsolete and the material in it will not yield over 5 per cent. of its cost. Indeed, it is now claimed by many leading telephone managers that the average life of telephone plant, as a whole, excluding only iron or tile underground conduit, does not exceed ten years.

Cost of Service: Exhibit "A" shows that the average revenue per subscriber for exchange service in the City of Baltimore for the past five years has been.... $87.29
And the cost of service has been..... 68.77

Leaving a profit, per subscriber, of..... $18.52

The average number of subscribers was 2,414. The yearly net revenue, $44,724.83.

The average revenue per subscriber for exchange service in all Maryland Exchanges for the past five years has been $84.03
And the cost of service has been..... 68.15

Leaving a profit, per subscriber, of..... $15.88

73*h* The average number of subscribers was 2,704. The yearly net revenue, $42,945.72.

Equal to 2.26 per cent. on capital and 4 per cent. on cost of plant.

There has been a loss in operating each of the Exchanges outside of Baltimore.

Exhibit "C" gives the comparative revenue and cost of Metallic and Grounded Circuit services in Baltimore in 1894 and 1895. From this exhibit it will be seen that the average revenue and cost of service per subscriber is as follows:

Metallic Circuit, Special, Revenue	$125.00
Cost of Service	89.60
Net profit	$35.40
Metallic Circuit, 2 party, Revenue	$100.00
Cost of Service	70.86
Net profit	$29.14
Grounded Circuit, Special Revenue	$78.00
Cost of service	64.15
Net Revenue	$13.85

Exhibit "D" gives the rates charged in sixteen cities, from which it will be seen that the rates in Baltimore are much lower than in any one of the five cities of New York, Chicago, Philadelphia, Boston, and St. Louis, which have a population equal to or larger than Baltimore, while in the second group of cities having a population from 200,000 to 300,000 (Census of 1890) the rates are about the same as in Baltimore. The average business rate for Metallic Circuit Special is $139.16 as against $125 in Baltimore; for Metallic Circuit, 2 party, $110.62 as against $100 in Baltimore; and for Grounded Circuit Special $93.07 as against $78 in Baltimore. In none of these cities does the maximum limit of distance from the Exchange exceed one mile, while in Baltimore for Grounded Circuit it is two miles.

73*i* Paradoxical as it may seem, the average cost of service per station increases instead of decreases until the economical limit of an exchange, about 4,500 subscribers is reached. From 1885 to 1895 the number of stations in Baltimore increased from 1,702 to 2,708. The cost of operating increased 42 per cent. per subscriber during this period. In 1885 the calls averaged 6.2 per day for each subscriber; in 1894 the calls averaged 10 per day for each subscriber; at the present time the daily average is 12 calls and the rate is constantly increasing.

In the report of the "Committee on Cities and Boroughs" made to the Senate of the State of Connecticut, 14th May, 1895, is the following relative to the cost of service: "The history of the telephone business has shown that there are some anomalous features in it when the question of cost is examined. An exchange of 1,000 subscribers cannot, in the light of experience be operated at anything like the same cost per subscriber that an exchange of 100 subscribers can be operated. There is an increase in every item of expense, and especially in what is classified as switchboard or operating expense. Actual experience of fifteen years shows that the switchboard work of an ex-

change of 1,000 is not ten times that of an exchange of 100 subscribers, but between thirty and forty times as great. It is also perfectly well demonstrated that the cost of plant per subscriber in an exchange of 1,000 will be more than double the cost of equipping the subscriber in a smaller exchange, and it follows from these facts that the charges to the city subscriber must be larger than to the country subscribers, and, of course, no rate which applies to both classes of service can be fair to both the Company and the subscribers. It must also be borne in mind that this increase of cost in the larger exchanges is not unreasonable, because it is patent on the face of it that the privilege of immediate connection with 1,000 people is of itself of more value to the subscriber than the privilege of connection with 100, and that the subscriber so equipped will inevitably use these facilities more in the larger than in the smaller places.

73*j* "The demands of service in the larger places are also more imperative and exacting than in small towns, because of its greater value. On account of the larger number of possible uses, the telephone subscriber comes to depend more on his instrument for the accomplishment of his daily business. It becomes necessarily of vastly more service to him and he naturally and properly insists that the quality of the service he receives shall be of the best. This makes it worth more to him and makes him willing to pay more. At the same time it makes it more costly to the Company to furnish it."

In view of these facts, it does not seem to me that the rates charged are unreasonable, nor that they can be reduced without injustice to the Company and impairing its service.

The provision in the law of 1892 which allows contracts for six months at the same rate as for a year, is, in my opinion, unjust to the Company. A short time contract is usually made for some specific purpose; the Company is put to expense in installing the service, not infrequently a sum more than half the rental for six months, and when the purpose of the subscriber is achieved, the instrument is withdrawn and the cost of installation lost. In Boston and some other cities, the rates charged for temporary service are one-half the yearly rental for three months' service and three-quarters the yearly rental for six months' service. If the service becomes permanent, the rental is adjusted to yearly rate from time of commencement. I would recommend such an amendment to the law regulating the rates the Company can charge.

Toll Service: Exhibit "B" gives revenue and cost of toll service on Western Maryland lines.

From this Exhibit, it will be seen that the average yearly loss on this service for the past five years has been $1,692.38.

The Company is allowed to charge fifteen cents for the first five minutes and five cents for each additional five minutes irrespective of distance.

The rate allowed by law is entirely too small to cover cost of service and effectually precludes any extension of the lines.

73k Experience has shown that not more than five services an hour can be had over a wire, the time lost in connecting lines, getting parties together and ringing off consuming from five to ten minutes. This makes the maximum revenue from a wire about seventy-five cents an hour.

An average telegraph operator will send one hundred and fifty words in five minutes over a wire. At the rates charged by the Western Union Telegraph Company for Western Maryland cities, twenty-five cents for the first ten words and two cents for each additional word, it makes a revenue of $3.05 for five minutes for the telegraph as against fifteen cents for the telephone wire. I have obtained the toll rates from companies operating in New England, Pennsylvania, New Jersey, Delaware, Ohio, Illinois, Indiana, and Iowa, and find that they all charge about one cent a mile for five minutes conversation. I think the following rates for this State would be fair to the public and the company:

Not over 10 miles.....15 cents.
From 10 to 30 miles.....25 cents.
From 30 to 50 miles.....1 cent per mile.
Exceeding 50 miles.....50 cents and ½ cent per mile.

These rates are lower than those prevailing elsewhere, but would, in my opinion, give the Company a fair return on its investment and encourage it to extend its lines to places not now in connection with Baltimore.

I herewith submit the following Exhibits:

A, Revenue and cost of Exchange Service.
B, Revenue and cost of Toll Service.
C, Comparative cost of Metallic and Grounded Circuit Service.
D, Rates for service in other cities.

I have the honor to remain
Yours very respectfully,

JNO. A. TOMPKINS.

EXHIBIT "A."

Revenue and cost of service of all Maryland Exchanges, 1891–1895.

	1891	1892	1893	1894	Ten months 1895	Average per annum.
REVENUE,						
Exchange service	$220,802.99	$215,811.81	$222,847.35	$234,453.62	$204,335.86	$227,224.48
EXPENSES,						
Operating	51,269.45	55,674.47	50,424.68	57,929.83	56,016.14	56.134.05
Maintenance	61,080.71	51,519 44	40,310.86	48,509.54	47,382.35	51,476.46
Rental and royalty	36,170.44	33,982.98	37,845.31	30,057.79	16,974.16	32,075.31
Taxes	13,274.53	11,529,80	15,622.14	15,619.39	12,760.62	14,235.82
Depreciation of plant	23,179.01	27,181.97	38,145.83	27,324.54	30,894.74	30,357.12
TOTAL cost of service	184,974.14	179,888.66	182,346.82	179,441.09	164,028.01	184,278.76
NET revenue	35,828.85	35,923.15	40,498 53	55,012.53	40,307.85	42,945.72
Average number of subscribers	2,564	2,422	2,677	2,801	3,058	2,704
Average revenue per subscriber	86.12	89.10	83.24	83.70	66.82	84.03
Average cost per subscriber	72.14	74.27	68.11	64.06	53.63	68.15

EXHIBIT "A."—Continued.

Revenue and cost of service of Baltimore Exchange, 1891-1895.

	1891	1892	1893	1894	Ten months 1895	Average per annum.
REVENUE,						
Exchange service	$203,536 33	$198,048.57	$205,642.70	$219,695.84	$182,249.02	$210,730.85
EXPENSES,						
Operating	44,062.52	47,958.09	43,126 84	51,216.74	50,244.00	48,953.42
Maintenance	56,454.11	48,647.58	36,219.16	44,976.68	38,588 08	46,528.06
Rent and royalty	31,554.58	29,057.48	33,065.86	27,142.68	16,005.29	28,308.80
Taxes	12,561.88	10,554.55	15,031.58	15,032.81	12,272.05	13,541.97
Depreciation of plant	21,194.69	25,175.91	36,206.73	25,409.03	30,603.52	28,673.77
TOTAL cost of service	165,827.78	161,393.61	163,650.17	163,777.94	147,712.94	166,006.02
NET revenue	37,708.55	36,654.96	41,992.53	55,277.90	44,536.08	44,724.83
Average number of subscribers	2,171	2,018	2,298	2,472	2,708	2,414
Average revenue per subscriber	93.75	98.14	89.48	88.61	70.99	87.29
Average cost per subscriber	76.38	79.98	71.21	66.25	54.54	68.77

EXHIBIT "A."—Continued.

Revenue and cost of service Frederick Exchange, 1891–1895.

	1891	1892	1893	1894	Ten months 1895	Average per annum.
REVENUE,						
Exchange service	$6,076 30	$6,253.86	$6,427.49	$5,580.84	$4,199.01	$5,904 31
EXPENSES,						
Operating	2,213.19	2,394.98	2,238.92	2,318 81	1,959.74	2,301.83
Maintenance	2,143.59	902.98	1,121.82	914.87	1,815.44	1,427.32
Rental and royalty	1,705.53	2,797.51	1,765 90	1,014.40	318.35	1,365.88
Taxes	206.57	349.63	185.12	182.52	145.88	221.32
Depreciation of plant	1,059.72	1,070.66	1 083.25	1,072.27	98.06	907.02
TOTAL cost of service	7,328.59	6,515.76	6,395.10	5,502.87	4,337 47	6,223.40
NET revenue			32.39	77.97		
DEFICIT in revenue	1,252.29	261 90			138.46	319.09
Average number of subscribers	1 0	142	133	116	116	129
Average revenue per subscriber	43.40	44.04	48 33	48.11	36.20	45.77
Average cost per subscriber	52.32	45.88	48.08	47.43	37.39	48.24

EXHIBIT "A."—Continued.

Revenue and cost of service of Hagerstown Exchange, 1891–1895.

	1891	1892	1893	1894	Ten months 1895	Average per annum.
REVENUE,						
Exchange service	$3,902.26	$4,004.04	$4,590.62	$4,406.76	$3,407.34	$4,326.49
EXPENSES,						
Operating	1,770.36	2,014.08	2,004.06	1,681.78	1,404.81	1,842.43
Maintenance	1,176.07	597.95	703.61	791.65	2,133.80	1,117.88
Rental and royalty	1,149.50	1,277.66	1,238.85	825.03	274.92	986.06
Taxes	150.63	259.57	171.98	172.76	137.34	184.61
Depreciation of plant	392.73	395.33	400.58	395.58	62.70	340.74
TOTAL cost of service	4,639.29	4,574.59	4,519.08	3,866.80	4,013.57	4,471.72
NET revenue		29.45	71.54	539.96		
DEFICIT in revenue	737.03				606.23	145.23
Average number of subscribers	88	99	97	90	94	94
Average revenue per subscriber	44.34	46.51	47.33	48.96	36.25	46.03
Average cost per subscriber	52.71	46.20	46.58	42.96	42.69	47.57

EXHIBIT "A"—Continued.

Revenue and cost of service Cumberland Exchange. 1891–1895.

	1981	1892	1893	1894	Ten Months 1895	Average per annum.
REVENUE,						
Exchange Service	$5,9 9 50	$5,558 87	$5,049 87	$4,471 73	$3,633 84	$5,109 09
EXPENSES,						
Operating	2,713 45	2,811 11	2,622 86	2,320 81	1,967 33	2,572 87
Maintenance	913 40	1,221 30	2,007 54	1,729 31	4,296 39	2,163 71
Rental and Royalty	1,529 53	1,656 22	1,610 24	977 61	323 15	1,261 40
Taxes	312 54	317 35	199 65	207 19	153 17	246 19
Depreciation of plant	213 73	221 92	137 57	130 88	99 98	166 36
TOTAL cost of service	5,682 65	6,227 90	6,577 86	5,365 80	6,840 02	6,350 53
NET revenue	296 85					
DEFICIT in revenue		669 03	1,527 99	894 07	3,206 18	1,241 44
Average number of subscribers	139	141	129	106	99	123
Average revenue per subscriber	43 02	39 42	39 14	42 19	36 71	41 45
Average cost per subscriber	40 87	44 17	50 99	50 60	69 09	51 63

EXHIBIT "A"—Continued.

Revenue and cost of service Westminster Exchanges, 1891–1895.

	1891	1892	1893	1894	Ten months 1895	Average per annum.
REVENUE,						
Exchange Service	$1,308 60	$1,346 47	$1,136 67	$938 45	$623 90	$1,107 74
EXPENSES,						
Operating	509 93	466 21	430 00	391 69	351 80	444 75
Maintenance	393 54	149 63	258 73	97 03	514 23	292 38
Rental and Royalty	231 30	194 11	164 37	98 07	41 90	150 98
Taxes	42 91	48 70	33 81	24 11	22 81	35 66
Depreciation of Plant	318 15	318 15	317 70	316 78	30 48	269 23
TOTAL cost of service	1,495 83	1,176 80	1,204 61	927 68	961 22	1,193 00
NET revenue	.....	169 67	.....	10 77	.....	.....
DEFICIT in revenue	187 23	.....	67 94	.....	337 32	85 26
Average number of subscribers	26	22	20	17	19	21
Average revenue per subscriber	50 33	61 20	56 83	55 20	32 84	52 75
Average cost per subscriber	57 53	53 48	60 23	54 57	50 59	56 80

Exhibit "B."

Revenue and cost of service Maryland Toll Lines, January 1, 1891, to October 31, 1895.

	Total for Whole Period.	Average Per Annum.
REVENUE,		
Frederick Line	$2,146 06	$444 01
Cumberland Line	1,683 77	348 37
Hagerstown Line	1,907 52	394 66
Westminster Line	1,562 72	323 32
TOTAL revenue	7,300 06	1,510 36
EXPENSES,		
Operating	3,178 38	657 59
Maintenance	10,459 28	2,163 99
Rental and Royalty	1,570 78	324 99
Taxes	271 48	56 17
TOTAL expenses	15,479 92	3,202 74
Net **LOSS** on Toll Service	8,179 86	1,692 38

EXHIBIT "C."

Statement showing average yearly cost of giving Metallic Circuit Special, Metallic Circuit Two-party, and Grounded Circuit Special, services in Baltimore, in 1894 and 1895.

Average No. G. C. Subscribers 2,144 Average No. M. C. Subscribers 446 Total 2,590	Metallic Circuit Special	Metallic Circuit Two-party	Grounded Circuit Special
Taxes	$ 9 36	$ 5 91	$ 5 39
Operating	24 16	22 62	21 96
Maintenance	27 56	19 93	16 61
Depreciation of Plant	18 55	13 41	11 17
Instrument Rental	8 99	8 49	8 04
Switchboard Royalty	96	48	96
Telegraph Commissions	02	02	02
TOTAL cost of Service	89 60	70 86	64 15
EXCHANGE RENTAL	125 00	100 00	78 00
NET profit	35 40	29 14	13 85
Per cent of cost to revenue	71 7-10	70 9-10	82 3-10

EXHIBIT "C."—Continued.

Statement showing comparative cost of giving metallic circuit special, metallic circuit two-party and grounded circuit special services in Baltimore, in 1894.

	Metallic Circuit Special	Metallic Circuit Two-party.	Grounded Circuit Special.
Average No. G. C. Subscribers	2,185		
Average No. M. C. Subscribers	287		
Total	2,472		
Taxes	10 10	6 37	5 81
Operating	23 32	21 84	21 20
Maintenance	29 03	20 99	17 49
Depreciation of Plant	16 40	11 85	9 88
Instrument Rental	10 38	10 38	10 38
Switchboard Royalty	96	48	96
Telegraph Commissions	02	02	02
TOTAL cost of Service	90 21	71 93	65 74
EXCHANGE RENTAL	125 00	100 00	78 00
NET profit	34 79	28 07	12 26
Per cent. of cost to revenue	72 2-10	71 9-10	84 3-10

EXHIBIT "C."—Continued.

Statement showing comparative cost of giving metallic circuit special, metallic circuit two-party and grounded circuit special services in Baltimore, in 1895.

Average No. G. C. Subscribers 2,102 Average No. M. C. Subscribers 606 Total 2,708	Metallic Circuit Special.	Metallic Circuit Two party.	Grounded Circuit Special.
Taxes	$8 63	$5 46	$4 97
Operating	24 99	23 40	22 72
Maintenance	26 10	18 87	15 72
Depreciation of Plant	20 70	14 96	12 47
Instrument Rental	7 60	6 60	5 70
Switchboard Royalty	96	48	96
Telegraph Commissions	02	02	02
TOTAL cost of Service	89 00	69 79	62 56
EXCHANGE RENTAL	125 00	100 00	78 00
NET profit	36 00	30 21	15 44
Per cent. of cost to revenue	71 2-10	69 8-10	80 2-10

EXHIBIT "D."

Telephone Rates 1895.

Population Census 1890	Cities	BUSINESS			RESIDENCES		
		METALLIC CIRCUIT		GROUNDED CIRCUIT	METALLIC CIRCUIT		GROUNDED CIRCUIT
		Special	Two-party	Special	Special	Two-party	Special
1,515,301	New York*	240	150	150	180	125	100
1,099,850	Chi ago	175	None	125	125	None	100
1,046,964	Philadelphia*	160	None	120	130	None	100
451,770	St. Louis	None	None	100	None	None	60 to 100
448,477	Boston*	156	135	120	110	96	96
434,439	Baltimore	125	100	78	100	80	78
296,908	Cincinnati	125	100	100	100	80	72
261,353	Cleveland	120	100	72	100	80	60
255,664	Buffalo	All measured service					
242,039	New Orleans	None	None	96	None	None	55
204,468	Milwaukee*	120	100	72	70	60	50
164,738	Minneapolis	120	100	72	100	80	60
133,896	Rochester	94	None	64	75	None	60
133,156	St. Paul	120	100	72	100	80	60
132,146	Providence	120	None	60	120	None	60
106,713	Denver	120	100	80	90	72	72
	Montreal	None	None	50			

*These cities have measured service also, i. e., a fixed rate for a certain number of messages and an additional charge for each message over this number.

Buffalo has measured service only. The report of the Committee of the City Council gives the average cost to subscribers in 1884 as being $110 per annum.

In Montreal the Company pays no royalty, taxes are very light and expenses, as shown by their statement, are about 60 per cent. of those in Baltimore.

J. FORREST MANNING & CO. '95.

74 *Memoranda.*

For Defendants' Exhibit No. 7,
See Testimony page..... 248
For Defendants' Exhibit No. 8,
See Testimony page..... 249
For Defendants' Exhibit No. 9,
See Testimony page..... 272

75 *Memoranda.*

For Defendants' Exhibit No. 11,
See Defendants' Testimony, page..... 330
For Defendants' Exhibit No. 12,
See Defendants' Testimony, page..... 328
For Defendants' Exhibit No. 13,
See Defendants' Testimony, page..... 343

76 DEFENDANT'S EXHIBIT, NO. 16.

1887 to 1892——— 7 years.

1892.....	1722	subs.		8	calls	per	sub.
1887.....	1299	"		4½	"	"	"
Increase.....	423	"		4½	"	"	" increase.

Per cent of increase, 32½ per cent subs.; 78 per cent increase in calls.

In 1887, 70 per cent of our subs. were on party lines.

In 1892, 19 per cent of our subs. were on party lines.

1892 to 1897———5 years.

1897.....	1822	subs.		10	calls	per	sub.
1892.....	1722	"		8	"	"	"
Increase.....	100	"		2	"	"	" increase.

Increase 5⅔ per cent in subs.; 25 per cent increase in calls.

1897 to 1885———12 years.

1897.....	1822	subs.		10	calls.
1885.....	1096	"		4⅓	"
Increase.....	726	"		5⅔	increase.

Increase, 66¼ per cent in subs.; 130 per cent.

77 *Memoranda.*

For Defendants' Exhibit No. 18,
See Defendants' Testimony, page..... 450
For Exhibit "A,"
See Defendants' Testimony, page..... 590
For Exhibit "B,"
See Defendants' Testimony, page..... 592
For Exhibit "C,"
See Defendants' Testimony, page..... 593
For Exhibit "D,"
See Defendants' Testimony, page..... 594
For Exhibit "E,"
See Defendants' Testimony, page..... 596

78 EXHIBIT "F."

Telephone Charges in the District of Columbia.

EXHIBIT AAA.—THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY, WASHINGTON PLANT.

Statement of work done by the construction department during the years 1892 *to* 1897, *inclusive.*

Year.	New poles set.	Old poles replaced with new	Poles removed and abandoned.	Increase in number of poles.	Increase in overhead wire.	Aerial cable.	Manholes built.
					Miles.	*Feet.*	
1892.....	524	227	.....	524	132.7	.....	B—78
1893.....	187	661	172	15	124.2	.....	(1894) A— 7
1894.....	129	84	60	69	67	.....	(1894) B— 9
1895.....	399	117	50	349	45.3	.....	B— 4
1896.....	13	261	17	4	189	.....	.....
1897.....	785	351	2	783	621	6,890	B—30
Total....	2,037	1,701	301	1,736	1,179.2	6,890	125

CONDUIT LAID.

	1-duct.	2-duct.	3-duct.	4-duct.	6-duct.	8-duct.	12-duct.	24-duct.	40-duct.	56-duct.	72-duct.
	Ft. In.	*Ft. In.*	*Ft. In.*	*Ft. In.*	*Ft. In.*	*Ft. In.*	*Feet.*	*Ft. In.*	*Ft. In.*	*Feet.*	*Feet.*
1892...	5,835	.....	.....	.....	24,277 4	6,963 6	.....	.....	.....	.....	.....
1893...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1894...	2,772	11	.....	.....	281 8	.....	.....	9 10	.....	26	76
1895...	953 11	47 5	.....	.....	51 6	.....	.....	.....	.....	.....	.....
1896...	1,000 9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1897...	937 10	1,038 9	.....	283 5	3,106 10	3,614 11	.....	.....	.....	.....	.....
Total	11,499 6	1,097 2	.....	283 5	27,717 4	10,578 5	.....	9 10	.....	26	76

CONDUIT ABANDONED.

1892...	308 9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1893...	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1894...	51	200	.....	.....	.....	73 9	.....	.....	81 6	.....	.....
1895...	134 2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1896...	527 5	202	.....	.....	180 10	.....	105	.....	.....	.....	.....
1897...	73 11	47 5	.....	.....	51 1	.....	.....	.....	.....	.....	.....
Total	1,095 3	499 5	.....	.....	151 11	73 9	105	.....	81 6	.....	.....

CABLE DRAWN IN.

	50-wire.	100-wire.	10-pair.	25-pair.	50-pair.	100-pair.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
1892	1,233				17,686	
1893	19,548	1,145			30,992	
1894					10,836	43,349
1895	2,087			547	3,606	14
1896			100	3	12,558	22,916
1897				386	5,347	23,930
Total	22,868	1,145	100	936	81,022	90,209

CABLE DRAWN OUT.

1892						
1893	4,173	6,083				
1894					17,748	
1895	2,087			125	177	14
1896			140		18,740	1,035
1897					814	
Total	6,260	6,083	140	125	37,479	1,049

Statement of work done by the construction department during the years 1892 *to* 1897, *inclusive*—Continued.

CABLE AND CONDUIT ABANDONED.

	Asphalt conduit.	Aerial.		Underground.		
		50-wire.	25-pair.	16-wire.	50-wire.	100-wire.
	Feet.	*Feet.*	*Feet.*	*Feet.*	*Feet.*	*Feet.*
1892						
1893	2,093					
1894					24,877	10,138
1895	2,197	600		850	8,273	12,202
1896	15,275				37,219	20,209
1897	9,045		83		6,525	5,728
Total	28,570	600	83	850	76,894	48,277

Exhibit BBB.—The Chesapeake and Potomac Telephone Company, Washington Branch.

Statement showing the value of the work done by the construction department, less the value of the work taken up or abandoned, during the years 1892 to 1897, inclusive.

	Net increase.	Average cost.	Value.
Poles:			
County	1,437	$4.14	$5,953.01
City	299	20.49	6,126.11
	1,736	.....	12,079.12
Conduits:	*Ft. In.*		
1-duct	10,404 3	.39	4,057.66
2-duct	647 9	.61	395.13
3-duct	283 5	.80	226.72
4-duct	27,565 5	1.02	28,116.73
6-duct	10,504 8	1.36	14,286.35
8-duct	*105	1.92	201.60
12-duct	9 10	3.36	33.04
24-duct	*81 6	5 60	456.40
40-duct	26	7.84	203.84
56-duct	76	10.64	808.64
72-duct			
	49,330 10	.....	47,470.12
Cable, underground:	*Feet.*		
60-wire	*60,886	.53	32,269.59
100-wire	*53,215	.73	88,846.95
10-pair	*40	.17	6.80
25-pair	728	.24	175.88
50-pair	43,543	.52	22,698.43
100-pair	89,160	.49	43,454.72
16 wire	*850	.23	195.50
	18,440	.....	4,989.75
Cable aerial:	*Feet.*		
25-pair	6,890	.23	1,584.70
Overhead wires:	*Miles.*		
Iron	3,132.2	9.00	2,818.80
Copper "B. and S."	591	18.09	10,689.38
Copper "N. B. S."	275	27.17	7,471.40
	3,998.2	.....	20,979.58
Manholes:			
A	7	200.00	1,400.00
B	89	125.00	11,125.00
B	30	105 00	3 150.00
	126	.....	15,675.00
Total	.....	.....	92,798.77
Less asphalt conduit abandoned, 28,570 feet, at $1.411	.....	.....	40,312.26
Total net increase	.....	.....	52,486.51

Items marked with an * indicate a decrease.

Exhibit "CCC."

The Chesapeake and Potomac Telephone Company, Washington Plant.

Amount charged to construction account on the books of the Chesapeake and Potomac Telephone Company during the years 1892 to 1897, inclusive, not including amounts charged for switch boards and equipment.

1892—Aerial construction	$4,157.64
Underground cable construction	10,386.40
Conduit construction	53,490.70
1893—Underground cable construction	9,326.01
1894—Aerial construction	2,633.87
Underground cable construction	20,117.92
Conduit construction	5,374.98

1895—Aerial construction		436.47
Conduit construction		349.80
Underground cable construction		194.34
Toll line, Rockville		1,679.01
1896—Conduit construction		2.25
Underground cable construction		5,366.72
Aerial construction		789.68
Toll lines, Rockville and Baltimore		2,482.08
		$115,208.51
Less amount received October 30, 1895, from the Metropolitan Railroad Company for cost of underground conduit; action necessitated by their change of motive power		$5,668.77
Net amount charged to construction 1892 to 1897, both inclusive		$109,539.74

80 EXHIBIT "G."

Amount expended for construction from the date of purchase of the plant, August 1, 1883, to December 31, 1897.

For eleven months from August 1, 1883, to June 30, 1884:		
General construction	$18,000.24	
Underground construction	16,288.05	
Multiple switchboard	5,935.09	
Washington and Baltimore line, $3,882.83, Washington proportion one-half	1,941.42	
Alexandria line	5.00	
Office furniture and fixtures	391.40	
Total		$42,561.20
For nine months from July 1, 1884, to March 31, 1885:		
General construction	8,407.51	
General construction, Georgetown	287.78	
General construction, north E street	354.37	
General construction, south E street	904.38	
General construction, Mount Pleasant	146.97	
Underground east division	40,813.86	
Multiple switchboard	8.00	
Office furniture and fixtures	272.61	
Total		51,255.48
For nine months, from April 1, 1885, to December 31, 1885:		
General construction	$4,394.40	
General construction, Georgetown	61.28	
General construction, North E street	417.47	
Underground, east division	3,238.81	
Underground, west division	11,777.43	
Underground, south division	1,103.45	
Underground, north division	6,681.44	
Rockville line	54.00	
Postal-wire line, Washington to Baltimore, $14,164.50; Washington proportion, one-half	7,082.25	
Office furniture and fixtures	150.04	
Total		$34,960.57
For year ended December 31, 1886:		
General construction	6,457.20	
Underground, north division	31.50	
Underground, south division	15,289.51	
Alexandria line	794.45	
Office furniture and fixtures	8.83	
Total		22,581.49

For year ended December 31, 1887:		
General construction	11,206.74	
Office furniture and fixtures	1,493.77	
Total		12,700.51
For year ended December 31, 1888:		
General construction	9,360.10	
Office furniture and fixtures	83.38	
Total		9,443.48
For year ended December 31, 1889:		
General construction	5,467.84	
Underground construction	1,081.71	
Office furniture and fixtures	145.14	
Total		6,694.69
For year ended December 31, 1890:		
General construction	9,479.93	
Switchboards	2,311.03	
Cable construction	1,746.50	
Underground construction	349.15	
Office furniture and fixtures	33.42	
Total		13,920.03
For year ended December 31, 1891:		
Underground construction	3,166.82	
Underground conduit construction	91,040.27	
Aerial construction	3,590.66	
Switchboards	387.15	
Equipment	1,143.24	
Total		99,328.14
For year ended December 31, 1892:		
Aerial construction	4,157.64	
Underground cable construction	10,386.40	
Conduit construction	53,490.70	
Switchboards	3,515.36	
Equipment	2,590.41	
Total		74,140.51
For year ended December 31, 1893:		
Underground cable construction	9,326.01	
Equipment	1,839.04	
Total		11,165.05
81 For year ended December 31, 1894:		
Aerial construction	$2,633.87	
Underground cable construction	20,117.92	
Underground conduit construction	5,374.98	
Equipment	18,714.67	
Total		$46,841.44
For the year ended December 31, 1895:		
Aerial construction	436.47	
Underground conduit construction	349.80	
Underground cable construction	194.34	
Equipment	1,525.42	
Toll line, Rockville	1,679.01	
Total		4,185.04
For year ended December 31, 1896:		
Underground conduit construction	2.25	
Underground cable construction	5,360.72	
Aerial construction	789.68	
Toll lines, Rockville and Baltimore	2,482.08	
Equipment	891.96	
Total		7,953.33

For year ended December 31, 1897:	
Equipment	9,364.36
Total	447,095.32
Less amount received October 30, 1895, from the Metropolitan Railroad Company for cost of underground conduit; action necessitated by their change of motive power	5,668.77
Net amount expended by the Chesapeake and Potomac Telephone Company for actual construction of telephone plant in the District of Columbia from August 1, 1883, to December 31, 1897	441,426.55
Amount expended for real estate in the District of Columbia from December, 1890, to December 31, 1897	36,154.39
Total construction expenses to December 31, 1897	477,580.94

Sources from which the money expended for construction was obtained.

August 1, 1883:	
From the original issue of $750,000 of capital stock there was realized cash and cash assets	$77,234.93
June 9 and 10, 1891:	
Amount contributed out of proceeds of sale of mortgage bonds, $360,000, Washington proportion, two-fifths	144,000.00
($400,000 of bonds sold at 90 per cent; the discount, $40,000, was charged to the surplus account.)	
December 23, 1897:	
Amount contributed out of proceeds of sale of mortgage bonds, $103,000; Washington proportion, two-fifths	41,200.00
(One hundred thousand dollars of bonds sold at 103 per cent; the premium, $3,000, was credited to the surplus account.)	
Amount contributed out of earnings of the company	215,146.01
Total	477,580.94

EXHIBIT "H."

Consideration for which the $750,000 of capital stock was originally issued.

$750,000 issued August 1, 1883, for the following consideration:		
Cash		$79,601.79
Accounts receivable		9,128.23
Supplies		3,618.24
Stock, National Fair Association, 1 share		100.00
		92,448.25
Less accounts payable		15,113.32
Net cash assets		77,334.93
Cost of actual construction of plant prior to August 1, 1883, valued at $118,580.40 on old company's books		91,130.21
Franchises, licenses, right of way, etc., valued at $425,160.21 on old company's books		581,534.86
Total		750,000.00

EXHIBIT "I."

Surplus resulting from the business of the Washington plant for the years 1891 to 1897, inclusive.

1891.	Earnings and miscellaneous income	$137,851.52	
	Expenses	$107,703.92	
	Dividends	22,500.00	
			130,203.92
	Surplus for year 1891		$27,647.60

1892.	Earnings and miscellaneous income		180,033.76	
	Expenses	107,026.33		
	Dividends	15,000.00		
			122,026.33	
	Surplus for year 1892			58,007.43
1893.	Earnings and miscellaneous income		195,535.94	
	Expenses	120,445.86		
	Dividends	18,750.00		
			139,195.86	
	Surplus for year 1893			56,340.08
1894.	Earnings and miscellaneous income		192,289.00	
	Expenses	129,045.89		
	Depreciation charged off	24,597.33		
	Dividends	15,000.00		
			168,643.22	
	Surplus for year 1894			23,646.38
1895.	Earnings and miscellaneous income		194,119.57	
	Expenses	108,102.75		
	Depreciation charged off	20,251.20		
	Dividends	15,000.00		
			143,353.95	
	Surplus for year 1895			50,765.62
1896.	Earnings and miscellaneous income		194,126.06	
	Expenses	121,794.34		
	Depreciation charged off	9,012.75		
	Dividends	22,500.00		
			153,307.09	
	Surplus for year 1896			40,818.97
1897.	Earnings and miscellaneous income		207,617.64	
	Expenses	186,616.79		
	Dividends	30,000.00		
			216,616.79	
	Deficit for year 1897			8,999.15
	Total surplus for seven years—1891 to 1897, inclusive			248,226.93

82 EXHIBIT "H."

Number of persons in the employ, in any capacity, of the Chesapeake and Potomac Telephone Company, in connection with its business in the District of Columbia, from the highest officer to the lowest-priced laborer, with a general statement of the nature of the employment of each and the compensation paid each.

Samuel M. Bryan, president and general manager, $8,000 per annum	$8,000.00
Vincent A. Hubbard, secretary to president and general manager, $1,500 per annum	1,500.00
W. P. Marsh, stenographer, $50 per month	600.00
Charles G. Beebe, treasurer, $3,000 per annum	3,000.00
Ira Howard Fill, Clerk, $1,200 per annum	1,200.00
H. W. Upperman, secretary and purchasing agent, $2,100 per annum	2,100.00
Henry D. Gasson, clerk, $600 per annum	600.00
Julius E. De Saules, acting auditor, $1,500 per annum	1,500.00
Irby W. Reid, clerk, $900 per annum	900.00
John W. Dyer, clerk, $800 per annum	800.00
Augustine Kenner, clerk, $800 per annum	800.00
Charles L. Glover, clerk, $700 per annum	700.00
Charles H. Coons, clerk, $50 per month	600.00
Walker B. Clarkson, clerk, $10 per week	520.00
M. J. Simmons, clerk, $10 per week	520.00

Augustus P. Crenshaw, general superintendent of construction, $1,800 per annum	1,800.00
Joseph E. Crandal, electrician and superintendent of equipment, $1,800 per annum	1,800.00
The amount of the annual salaries of the above-mentioned officers and employees is $26,940, and of this sum the proportion properly chargeable to the District of Columbia is	10,835.27
Miscellaneous employees:	
C. M. Mallam, contract clerk, $1,200 per annum	1,200.00
D. M. Steers, storekeeper, $10 per week	520.00
Fred. A. Lent, messenger boy, $3 per week	156.00
Miss A. C. Pumphrey, assistant stenographer, $7 per week	364.00
Miss M. O'Gorman, assistant stenographer, $10 per week	520.00
A. E. Barbour, office boy, $5 per week	260.00
Albert H. Osterman, office boy, $7 per week	364.00
Office of electrician and superintendent of equipment, and custodian of building:	
A. E. Williams, clerk, $50 per month	600.00
D. A. Edwards, chief inspector, $1,200 per annum	1,200.00
J. W. De Groot, switch-board man, $60 per month	720.00
H. M. Crandall, second assistant test operator, $8 per week	416.00
Edgar Speiden, test operator, $1,200 per annum	1,200.00
W. A. Butler, jr., assistant test operator, $67.50 per month	810.00
Harry Miller, inspector, $19.23 per week	1,000.00
A. M. Righter, inspector, $13.85 per week	720.00
R. W. Bretney, instrument man, $9 per week	468.00
John E. Rowles, battery man, $600 per annum	600.00
W. A. Kendrick, engineer, $900 per annum	900.00
Franklin Young, night fireman, $45 per month	540.00
C. Cox, janitor, $10 per week	520.00
George F. Hatton, elevator boy, $8.50 per week	442.00
F. T. Iddings, special inspector, $17.31 per week	900.00
D. H. Washburn, inspector, $13.85 per week	720.00
C. E. Mahoney, instrument man, $13.85 per week	720.00
H. D. Moyer, inspector, $13.85 per week	720.00
Charles Kaufman, instrument man, $9 per week	468.00
L. M. Heron, instrument man, $12 per week	624.00
E. M. Wev, instrument man, $12 per week	624.00
Charles A. Springer, instrument man, $12 per week	624.00
Harold B. Stabler, instrument man, $9 per week	468.00
Henry C. Montague, instrument man, $12 per week	624.00
H. B. De Croot, apprentice, $5 per week	260.00
J. R. Sands, carpenter, $18 per week	936.00
Operating department:	
B. L. Nevins, jr., chief operator, $1,200 per annum	1,200.00
C. M. Baldwin, night operator, $9.23 per week	480.00
F. W. Chappel, night operator, $7 per week	$364.00
James W. Talbot, night operator, $7 per week	364.00
Miss Annie A. Prosperi, operator, $8.50 per week	442.00
Miss Jennie A. Boyle, operator, $8.50 per week	442.00
Miss Maggie E. Mudd, operator, $8.50 per week	442.00
Miss Lizzie C. Prosperi, operator, $7.25 per week	377.00
Miss Anna E. Smith, operator, $7.25 per week	377.00
Miss Blanche Thompson, operator, $7.25 per week	377.00
Miss Mamie R. Smith, operator, $6.25 per week	325.00
Miss Helen E. Walmsley, operator, $6.25 per week	325.00
Miss Ada I. Pumphrey, operator, $6.25 per week	325.00
Miss Bessie Creney, operator, $5.75 per week	299.00
Miss Lottie Miller, operator, $5.75 per week	299.00
Miss E. Addie Parker, operator, $5.75 per week	299.00
Miss Effie M. Cooke, operator, $5.75 per week	299.00
Miss Anne J. Branson, operator, $5.75 per week	299.00
Miss Fannie E. Newman, operator, $5.75 per week	299.00
Miss Emma F. Hayward, operator, $5.75 per week	299.00
Miss Maude M. Keck, operator, $5.75 per week	299.00

Miss Jessie Richardson, operator, $5.75 per week	299.00
Miss Eva K. Webster, operator, $5.75 per week	299.00
Miss Lida Q. Godfrey, operator, $5.75 per week	299.00
Miss Mary R. Barker, operator, $5.25 per week	273.00
Miss Tillie C. Hull, operator, $5.25 per week	273.00
Miss Aspasia Prosperi, operator, $5.25 per week	273.00
Miss Daisy Radigan, operator, $4.75 per week	247.00
Miss Ida J. Webb, operator, $4.75 per week	247.00
Miss Emily G. Miller, operator, $4.17 per week	216.84
Miss Edna E. Bobb, operator, $4.17 per week	216.84
Miss Beulah E. Wilson, operator, $4.17 per week	216.84
Miss Bessie M. Glass, operator, $4.17 per week	216.84
Miss Ella H. Collett, operator, $4.17 per week	216.84
Miss Nellie Lowe, operator, $4.17 per week	216.84
Miss Mamie Williams, operator, $4.17 per week	216.84
Miss Lucy Shopland, operator, $4.17 per week	216.84
Miss Henrietta Shaw, janitress, $5 per week	260.00
William Dodge, collector, $1,144 per annum	1,144.00
W. C. Brooke, assistant collector, $50 per month	600.00
R. J. Meigs, canvasser, $11.54 per week	600.00
G. B. Nichol, canvasser, $10 per week	520.00
Construction department:	
W. M. Beall, clerk, $720 per annum	720.00
Meyers Hand, clerk, $5 per week	620.00
Erwin L. Bradford, draftsman, $20 per week	1,040.00
M. K. Crenshaw, cable inspector, $1,000 per annum	1,000.00
J. B. MacKenzie, foreman, $1,000 per annum	1,000.00
R. G. Tinkler, foreman, $1,000 per annum	1,000.00
Joe Ebert, line inspector, $2.25 per day	702.00
A. Harmon, line inspector, $2.25 per day	702.00
J. Tenly, lineman, $2.25 per day	702.00
F. Ford, lineman, $2.25 per day	702.00
E. O'Connor, lineman, $2.25 per day	702.00
S. W. Fowler, lineman, $2.25 per day	702.00
R. E. Lowery, lineman, $2 per day	624.00
E. R. Aldrich, lineman, $2 per day	624.00
W. H. Soper, lineman, $2 per day	624.00
C. Gerhardt, lineman, $2 per day	624.00
E. Bailey, lineman, $2 per day	624.00
J. Moody, lineman, $2 per day	624.00
H. Gerhardt, lineman, $2 per day	624.00
H. Merson, lineman, $2 per day	624.00
T. Gray, lineman, $2 per day	624.00
J. Dove, lineman, $2 per day	624.00
D. S. Green, lineman, $2 per day	624.00
C. Weeks, lineman, $2 per day	624.00
A. Hepburn, lineman, $2 per day	624.00
George Ellis, lineman, $2 per day	624.00
C. Mills, lineman, $2 per day	624.00
W. V. McCutt, lineman, $2 per day	624.00
83 W. R. Nagle, lineman, $2 per day	624.00
T. J. Van Dyl, lineman, $2 per day	624.00
H. T. Snoots, lineman, $2 per day	624.00
W. Merson, lineman, $2 per day	624.00
H. Divver, horse and cart, $2 per day	624.00
D. Coberth, helper, $1.50 per day	468.00
S. Williams, helper, $1.50 per day	468.00
A. Frizzell, helper, $1.50 per day	468.00
C. Terrett, helper, $1.50 per day	468.00
J. Steurernagel, helper, $1.50 per day	468.00
S. Guy, helper, $1.50 per day	468.00
E. D. Vernon, helper, $1.50 per day	468.00
George Rentzler, helper, $1.50 per day	468.00
A. Deanell, helper, $1.50 per day	468.00
E. Divver, helper, $1.50 per day	468.00
J. A. Fowler, helper, $1.50 per day	468.00

E. Adams, helper, $1.50 per day	468.00
W. F. Burgess, helper, $1.50 per day	468.00
C. Fowler, helper, $1.50 per day	468.00
C. Frizzell, helper, $1.50 per day	468.00
W. Mothershead, helper, $1.50 per day	468.00
W. Ebert, helper, $1.50 per day	468.00
T. Burke, helper, $1.50 per day	468.00
P. Brown, helper, $1.50 per day	468.00
E. F. Moore, helper, $1.25 per day	390.00
W. E. Dean, helper, $1.25 per day	390.00
E. Stevens, helper, $1.25 per day	390.00
F. Miller, helper, $1.25 per day	390.00
E. Jones, helper, $1.25 per day	390.00
J. Harrison, helper, $1.25 per day	390.00
C. Cunningham, helper, $1.25 per day	390.00
G. Brown, helper, $1.25 per day	390.00
W. F. Maxey, helper, $1.25 per day	390.00
C. Lee, water boy, 60 cents per day	187.20
A. L. Keefer, storekeeper, $1.50 per day	468.00
Total	$2,737.19

This total varies somewhat from and is considerably in excess of the actual amount expended for the District of Columbia portion of the service during the year 1897, for the reason that many of the employees, whose annual pay in this statement has been reckoned according to the daily-wage pay, naturally lose a large amount of time during the year by reason of illness or inability to work due to inclemency of the weather, and, pending such illness or inclement weather, their wages stop.

84 EXHIBIT "I."

Number of persons in the employ, in any capacity of The Chesapeake and Potomac Telephone Company, in connection with its business in the District of Columbia, from the highest officer to the lowest-priced laborer, with a general statement of the nature of the employment of each and the yearly compensation paid each—

As per pay roll of July 1st, 1898:

Samuel M. Bryan, president and general manager	$8,000.00	per annum
V. A. Hubbard, secretary to president and general manager	1,500.00	" "
W. P. Marsh, stenographer	720.00	" "
Charles G. Beebe, treasurer	3,000.00	" "
I. Howard Fill, clerk	1,200.00	" "
Horace W. Upperman, secretary and purchasing agent	2,100.00	" "
H. D. Gasson, clerk	720.00	" "
Julius E. De Saules, acting auditor	1,500.00	" "
John W. Dyer, clerk	800.00	" "
Augustine Kenner, clerk	800.00	" "
Chas. L. Glover, clerk	700.00	" "
W. B. Clarkson, clerk	520.00	" "
M. J. Simmons, clerk	520.00	" "
T. B. Clarkson, clerk	416.00	" "
Charles H. Coons, clerk	600.00	" "
Augustus P. Crenshaw, general superintendent of construction	2,100.00	" "
Joseph E. Crandall, electrician and superintendent of equipment	2,100.00	" "
	$27,296.00	
Less 60 per cent. for Baltimore and Western Maryland exchanges	16,377.60	
	10,918.40	

85	Miscellaneous employees:		
	C. M. Mallam, contract clerk	$1,200.00	per annum
	D. M. Steers, storekeeper	720.00	" "
	Fred. A. Lent, office boy	156.00	" "
	Miss A. C. Pumphrey, assistant stenographer	416.00	" "
	A. H. Osterman, office boy	442.00	" "
	W. A. Shreeve, office boy	156.00	" "
	Carey Scribner, office boy	130.00	" "
	W. C. Brooke, collector	600.00	" "
	A. L. Keefer, assistant to storekeeper	600.00	" "
		4,420.00	
	Office of Electrician and Superintendent of Equipment and Custodian of Buildings:		
	A. E. Williams, clerk	$720.00	" "
	D. A. Edwards, chief inspector	1,200.00	" "
	J. W. De Groot, switchboard man	720.00	" "
	H. M. Crandall, 2d assistant test operator	416.00	" "
	Edgar Speiden, jr., test operator	1,200.00	" "
	Wm. A. Butler, jr., assistant test operator	810.00	" "
	Harry Miller, inspector	1,000.00	" "
	A. M. Righter, inspector	720.00	" "
	J. E. Rowles, battery man	600.00	" "
	Wm. A. Kendrick, engineer	900.00	" "
	Franklin Young, night fireman	540.00	" "
	C. Cox, janitor	520.00	" "
	George F. Hatton, elevator boy	442.00	" "
	F. T. Iddings, special inspector	900.00	" "
	D. H. Washburn, inspector	720.00	" "
	C. E. Mahorney, instrument man	720.00	" "
	H. D. Mayer, inspector	720.00	" "
86	H. C. Legge, inspector	720.00	" "
	Charles Kaufman, instrument man	468.00	" "
	Chas. A. Springer, instrument man	624.00	" "
	Harold D. Stabler, instrument man	468.00	" "
	Harry C. Montague, instrument man	624.00	" "
	James R. Sands, carpenter	936.00	" "
	Louis M. Evans, instrument man	468.00	" "
	Arthur Lowe, instrument man	312.00	" "
	Charles S. Pardoe, assistant in electrical department	1,040.00	" "
		18,508.00	
	Operating Department:		
	B. L. Nevius, jr., chief operator	$1,200.00	" "
	C. M. Baldwin, night operator	480.00	" "
	James W. Talbot, night operator	364.00	" "
	Annie A. Prosperi, operator	442.00	" "
	Jennie A. Boyle, operator	442.00	" "
	Maggie E. Mudd, operator	442.00	" "
	Lizzie C. Prosperi, operator	442.00	" "
	Helen E. Walmsley, operator	377.00	" "
	Blanche Thompson, operator	377.00	" "
	Annie J. Branson, operator	325.00	" "
	Jessie Richardson, operator	325.00	" "
	Ada I. Pumphrey, operator	325.00	" "
	Bessie Creney, operator	299.00	" "
	Lottie Miller, operator	299.00	" "
	E. Addie Parker, operator	299.00	" "
	Effie M. Cooke, operator	299.00	" "
	Mary R. Baker, operator	299.00	" "
	Fannie E. Newman, operator	299.00	" "
	Emma F. Hayward, operator	299.00	" "
87	Maud M. Keck, operator	299.00	" "
	Aspasia Prosperi, operator	299.00	" "
	Eva K. Webster, operator	299.00	" "
	Lida Q. Godfrey, operator	299.00	" "
	Ida J. Webb, operator	273.00	" "
	Tillie C. Hull, operator	273.00	" "

Edna E. Bobb, operator	273.00	"	"
Bessie M. Glass, operator	247.00	"	"
Ella H. Collett, operator	247.00	"	"
Blanche M. Pumphrey, operator	216.84	"	"
Ada E. Clarke, operator	216.84	"	"
Portia Sommerville, operator	216.84	"	"
Mamie Williams, operator	216.84	"	"
Mamie L. McCormick, operator	216.84	"	"
Edna F. Knotts, operator	216.84	"	"
Nellie Lowe, operator	216.84	"	"
Lucy Shopland, operator	216.84	"	"
Henrietta Shaw, janitress	260.00	"	"
	12,072.72		

Construction Department:

W. M. Beall, clerk	$720.00	per annum	
Myers Hand, clerk	260.00	"	"
Edwin L. Bradford, draughtsman	1,040.00	"	"
M. K. Crenshaw, cable inspector	1,000.00	"	"
J. D. MacKenzie, foreman	1,000.00	"	"
R. G. Tinkler, foreman	1,000.00	"	"
Joe Ebert, line inspector	702.00	"	"
A. Harmon, line inspector	702.00	"	"
John Tenley, lineman	702.00	"	"
Frank Ford, lineman	702.00	"	"
88 E. O'Connor, lineman	$702.00	"	"
S. R. Fowler, lineman	702.00	"	"
E. R. Aldrich, lineman	624.00	"	"
R. E. Lowrey, lineman	624.00	"	"
W. H. Soper, lineman	624.00	"	"
C. Gerhardt, lineman	624.00	"	"
E. Bailey, lineman	624.00	"	"
J. Dove, lineman	624.00	"	"
D. S. Green, lineman	624.00	"	"
H. Gerhardt, lineman	624.00	"	"
H. Merson, lineman	624.00	"	"
J. Moody, lineman	624.00	"	"
O. T. Gray, lineman	624.00	"	"
C. Weeks, lineman	624.00	"	"
D. Corberth, helper	$468.00	"	"
A. Frizzell, helper	468.00	"	"
C. Terrett, helper	468.00	"	"
J. Steurnagle, helper	468.00	"	"
S. Guy, helper	468.00	"	"
E. D. Vernon, helper	468.00	"	"
S. Williams, helper	468.00	"	"
W. Merson, lineman	624.00	"	"
C. Mills, lineman	624.00	"	"
W. V. McCutt, lineman	624.00	"	"
W. R. Nagle, lineman	624.00	"	"
H. T. Snoots, lineman	624.00	"	"
T. J. Van Dyke, lineman	624.00	"	"
89 H. Divver, horse and cart	624.00	"	"
A Deanman, helper	468.00	"	"
G. Rentzell, helper	468.00	"	"
J. Harrison	468.00	"	"
C. Frizzell	468.00	"	"
E. Jones	468.00	"	"
W. T. Burgess	468.00	"	"
W. E. Deane	648.00	"	"
J. Keep	648.00	"	"
E. Brown	648.00	"	"
M. Maxey	468.00	"	"
E. F. Moore	468.00	"	"
E. Divver	468.00	"	"
	29,980.00		

Summary.

Sheet No. 1	$27,296.00	
Less 60 per cent. for Baltimore and Western Maryland exchanges	16,377.60	
		10,918.40
Sheet No. 2		4,420.00
Sheet No. 3		18,508.00
Sheet No. 4		12,072.72
Sheet No. 5		29,980.00
Total yearly amount of pay roll as of pay roll, July 1, 1898		75,899.12

90 EXHIBIT "K."

Number of persons in the employ, in any capacity, of The Chesapeake and Potomac Telephone Company, in connection with its business in the District of Columbia, from the highest officer to the lowest-priced laborer, with a general statement of the nature of the employment of each and the yearly compensation paid each—

As per Pay Roll of September 30, 1898.

Sheet No. 1:		
Samuel M. Bryan, president and general manager	$8,000.00	per annum
V. A. Hubbard, secretary to president and general manager	1,800.00	" "
W. P. Marsh, stenographer	720.00	" "
Charles G. Bebee, treasurer	3,000.00	" "
I. Howard Fill, clerk	1,200.00	" "
Horace W. Upperman, secretary and purchasing agent	2,100.00	" "
H. D. Gasson, clerk	720.00	" "
Julius E. De Saules, acting auditor	1,500.00	" "
John W. Dyer, clerk	800.00	" "
Augustine Kenner, clerk	700.00	" "
Charles L. Glover, clerk	700.00	" "
W. B. Clarkson, clerk	720.00	" "
M. J. Simmons, clerk	520.00	" "
T. B. Clarkson, clerk	416.00	" "
W. S. Morgan, clerk	600.00	" "
E. K. Hertford, clerk	520.00	" "
W. T. Rollins, clerk	520.00	" "
Augustus P. Crenshaw, general superintendent of construction	2,100.00	" "
Joseph E. Crandall, electrician and superintendent of equipment	2,100.00	" "
	28,836.00	
91 Less 60 per cent. for Baltimore and Western Maryland exchanges	17,301.60	
	11,534.40	
Miscellaneous employees:		
C. M. Mallam, contract clerk	$1,200.00	per annum
D. M. Steers, storekeeper	720.00	" "
Fred. A. Lent, office boy	208.00	" "
Miss A. C. Pumphrey, assistant stenographer	416.00	" "
A. H. Osterman, contract clerk	442.00	" "
Carey Scribner, office boy	182.00	" "
Corning De Saules, office boy	208.00	" "
W. C. Brooke, collector	600.00	" "
A. L. Keefer, assistant to storekeeper	600.00	" "
A. Lowe, assistant to storekeeper	364.00	" "
	4,940.00	

Office of Electrician and Superintendent of Equipment and Custodian of Building:			
A. E. Williams, clerk	$720.00	"	"
D. A. Edwards, chief inspector	1,200.00	"	"
J. W. De Groot, switchboard man	720.00	"	"
H. M. Crandall, 2d assistant test operator	416.00	"	"
Edgar Speiden, jr., test operator	1,200.00	"	"
Wm. A. Butler, jr., assistant test operator	810.00	"	"
Harry Miller, inspector	1,000.00	"	"
A. M. Righter, inspector	720.00	"	"
John E. Rowles, battery man	600.00	"	"
Wm. A. Kendrick, engineer	900.00	"	"
Franklin Young, night fireman	540.00	"	"
92 C. Cox, janitor	520.00	"	"
George A. Hatton, elevator boy	442.00	"	"
F. T. Iddings, special inspector	900.00	"	"
D. H. Washburn, inspector	720.00	"	"
C. E. Mahorney, instrument man	720.00	"	"
H. D. Moyer, inspector	720.00	"	"
H. C. Legge, inspector	720.00	"	"
Charles Kaufman, instrument man	469.50	"	"
Charles A. Springer, inspector	720.00	"	"
Harold B. Stabler, instrument man	469.50	"	"
Henry C. Montague, instrument man	626.00	"	"
J. R. Sands, carpenter	939.00	"	"
Lewis M. Evans, instrument man	469.50	"	"
James Matthews, instrument man	260.00	"	"
Charles S. Pardoe, assistant in electrical department	1,040.00	"	"
	18,561.50		
Operating department:			
B. L. Nevius, jr., chief operator	$1,200.00	per annum	
C. M. Baldwin, night operator	490.00	"	"
Frank W. Chappel, night operator	364.00	"	"
James W. Talbot, night operator	364.00	"	"
Annie A. Prosperi, operator	442.00	"	"
Jennie A. Boyle, operator	442.00	"	"
Maggie E. Mudd, operator	442.00	"	"
Lizzie C. Prosperi, operator	377.00	"	"
Helen E. Walmsley, operator	377.00	"	"
Blanche Thompson, operator	377.00	"	"
Annie J. Branson, operator	325.00	"	"
93 Jessie Richardson, operator	325.00	"	"
Ada I. Pumphrey, operator	325.00	"	"
Bessie Creney, operator	299.00	"	"
Lottie Miller, operator	299.00	"	"
E. Addie Parker, operator	299.00	"	"
F. E. M. Cook, operator	299.00	"	"
May R. Baker, operator	299.00	"	"
Fannie E. Newman, operator	299.00	"	"
Emma F. Wayward, operator	299.00	"	"
Maud M. Keck, operator	299.00	"	"
Aspasia Prosperi, operator	299.00	"	"
Eva K. Webster, operator	299.00	"	"
Lida Q. Godfrey, operator	299.00	"	"
Ida J. Webb, operator	273.00	"	"
Tillie C. Hull, operator	273.00	"	"
Edna E. Bobb, operator	273.00	"	"
Bessie M. Glass, operator	247.00	"	"
Ella H. Collett, operator	247.00	"	"
Blanche Pumphrey, operator	216.84	"	"
Ada E. Clark, operator	216.84	"	"
Portia Sommerville, operator	216.84	"	"
Mamie Williams, operator	216.84	"	"
Mary L. McCormick, operator	216.84	"	"
Edna F. Knotts, operator	216.84	"	"

	Nellie Lowe, operator	216.84	" "
	Lucy Shopland, operator	216.84	" "
	Henrietta Shaw, janitress	200.00	" "
		12,446.72	
94	Construction department:		
	W. N. Beall, clerk	$720.00	per annum
	Myers Hand, clerk	364.00	" "
	E. L. Bradford, draughtsman	1,040.00	" "
	M. K. Crenshaw, cable inspector	1,000.00	" "
	J. B. McKenzie, foreman	1,000.00	" "
	R. G. Tinkler, foreman	1,000.00	" "
	J. Ebert, line inspector	704.00	" "
	A. Harman, line inspector	704.00	" "
	J. Tenley, lineman	704.00	" "
	F. Ford, lineman	704.00	" "
	E. O'Connor, lineman	704.00	" "
	S. A. Fowler, lineman	704.00	" "
	H. Merson, lineman	704.00	" "
	E. R. Aldridge, lineman	626.00	" "
	C. Gerhardt, lineman	626.00	" "
	E. Bailey, lineman	626.00	" "
	D. S. Green, lineman	626.00	" "
	H. Gerhardt, lineman	626.00	" "
	J. Moody, lineman	626.00	" "
	T. Gray, lineman	626.00	" "
	C. Weeks, lineman	626.00	" "
	W. Merson, lineman	626.00	" "
	C. Mills, lineman	626.00	" "
	D. Coberth, helper	469.50	" "
	A. Frizzell, helper	469.50	" "
	C. Terrett, helper	469.50	" "
	J. Steurnagle, helper	469.50	" "
	S. Guy, helper	469.50	" "
	E. D. Vernon, helper	469.50	" "
95	S. Williams, helper	469.50	" "
	W. R. Nagle, lineman	626.00	" "
	H. F. Snoots, lineman	626.00	" "
	T. J. Von Dyl, lineman	626.00	" "
	J. V. Sutton, lineman	626.00	" "
	H. J. Wright, lineman	626.00	" "
	H. Divver, horse and cart	626.00	" "
	G. W. Hughes, bricklayer	1,200.52	" "
	G. Rentzel, helper	469.50	" "
	A. Deanell, helper	469.50	" "
	E. Divver, helper	469.50	" "
	J. Harrison, helper	469.50	" "
	E. Brown, helper	469.50	" "
	W. F. Burgess, helper	469.50	" "
	J. A. Fowler, helper	469.50	" "
	W. H. Brown, helper	469.50	" "
	E. Stevens, helper	469.50	" "
	J. Howard, helper	469.50	" "
	C. Fowler, helper	469.50	" "
	E. Jones, helper	469.50	" "
	F. Smith, helper	469.50	" "
	Jack Ebert, helper	469.50	" "
	F. Miller, helper	469.50	" "
	B. Carter, helper	469.50	" "
	J. Finney, helper	469.50	" "
	N. Marshall, plumber's helper	469.50	" "
	E. Marshall, plumber's helper	469.50	" "
		34,101.52	

96 *Summary.*

Sheet No. 1	$28,836.00	
Less 60 per cent. for Baltimore and Western Maryland exchanges	17,301.60	11,534.40
Sheet No. 2		4,940.00
Sheet No. 3		18,561.50
Sheet No. 5		12,446.72
Sheet No. 6		34,101.52
Total yearly amount of pay roll as of pay roll, September 30, 1898		81,584.14

Memorandum.

For EXHIBIT "L."

See Defendant's Testimony, page 661

97 EXHIBIT "M."

Cost of Duplicating the Company's Electrical Plant, including Switchboards, as of June 30, 1898.

Cost of main switchboard, including distributing boards, power plant, cable, labor, etc	$34,052.27
Expense re-arranging building for terminal room, and other changes to adapt building for switchboard and other equipment	3,611.15
Cost of department switchboards, including cost of a switchboard, miscellaneous material and labor installing same	8,904.07
Cost of subscriber's station equipment (metallic circuit), including bells, backboards, wall cabinets, desk cabinets, portable desk sets, protector, wire and labor	16,839.69
Cost of subscriber's station equipment (grounded circuit), including bells, backboards, desk sets, wire and labor	19,387.28
Cost of speaking tubes—	
Private lines	4,061.17
Extension stations	1,784.75
Cost of installing public stations, including all apparatus, booths, wire, miscellaneous and labor	7,835.03
Total	96,475.40

Memorandum.

98 For Defendants' EXHIBIT "N."

See Defendants' Testimony, page 767

99 EXHIBIT "O."

No.	Name	Calls Oct 27	Calls Oct 31	Calls Nov 1	Average Daily Calls	Annual calls (300 days)
1227	National Bank of Wash.	10	16	30	19	5,700
1606	W. W. Chambers	9	13	35	19	5,700
1478	Equity Building	13	33	17	21	6,300
671	Somerville & Son	16	31	16	21	6,300
584	Navy Dept. Bureau of Construction & Repair.	30	15	22	22	6,600
328	S. S. Daish	22	19	30	23	6,900
1435	Nat'l. McKay	24	30	15	23	6,900
1528	Concord Apartment House	21	14	35	23	6,900
1572	War D pt. 1744 G st	21	31	17	23	6,900
1193	H. W. Offutt	17	21	30	23	6,900
1577	Brooke & Harry	30	22	20	24	7,200

EXHIBIT "O."—Continued.

No.	Name	Calls Oct 27	Calls Oct 31	Calls Nov 1	Average Daily Calls	Annual calls (300 days)
263	Springman's Express...	33	19	24	25	7,500
107	Dept. of Justice.....	26	18	31	25	7,500
692	John C. Walker.....	.....	20	31	25	7,500
822	Javins and Company ...	34	14	28	25	7,500
1814	C. F. Manning.....	44	13	18	25	7,500
384	Wimsatt & Uhler	33	14	30	26	7,800
653	C. C. Bryan	22	31	35	26	7,800
348	Fisher & Co.....	31	30	19	27	8,100
284	C. D. Kenny, 7th & I...	34	27	30	27	8,100
390	W. B. Gurley & Co.....	24	28	36	28	8,100
1048	Southern Railway Co...	24	31	26	27	8,100
1199	Potomac Electric Power Co	86	26	19	27	8,100
1819	Fendall Building.....	22	28	31	27	8,100
560	Kann Sons & Co	32	26	25	28	8,400
1580	B. & O. Baggage Room .	19	27	37	28	8,400
100						
1733	John Kennedy.....	36	20	29	28	8,400
1204	Evening Star	40	23	22	28	8,400
1336	Hotel Gordon.....	31	32	24	29	8,700
1782	Wash'n Grain Exchange	33	23	31	29	8,700
862	The Raleigh	38	20	32	30	9,000
1017	W. H. Saunders & Co ..	28	32	29	30	9,000
377	The Shoreham.....	33	16	40	30	9,000
1109	Marshal's Office.....	46	25	21	30	9,000
1877	U. S. Electric Light Co.	25	23	43	30	9,000
125	Thos. R. Riley.....	36	20	37	31	9,300
467	Am. Security & Trust Co	30	39	24	31	9,300
682	Navy Dept. Chief Clerk.	23	33	36	31	9,300
379	B. H. Warner & Co.....	30	51	13	31	9,300
381	B. & O. Ticket Office....	31	37	28	32	9,600
1412	Frank Hume.....	30	22	42	32	9,600
1861	Saks & Co.....	31	33	31	32	9,600
342	Albright & Barker.....	25	29	41	32	9,600
481	Chas. Early.....	18	34	16	33	9,900
495½	Littlefield, Alvord & Co.	31	38	29	33	9,900
160	Barber & Ross.....	26	31	42	33	9,900
706	The Portland.....	27	38	34	33	9,900
1294	M. W. Beveridge.....	36	34	28	33	9,900
1045	A. G. Johnson.....	31	42	26	33	9,000
750	Norfolk & Wash. Steabt Co.....	28	28	47	34	10,200
1875	Weather Bureau.....	38	32	34	35	10,500
712	Allegheny Company....	27	39	42	36	10,800
1861	V. Baldwin Johnson....	44	38	31	37	11,100
1562	War Dept. Adjt. Genl...	27	47	36	37	11,100
180	Riggs Nat'l Bank.....	47	37	32	39	11,700
940	John H. Magruder.....	48	36	41	42	12,600
101						
729	Johnson Bros	40	49	41	43	12,900
1975	Wash. Loan & Trust Bldg	30	36	63	43	12,900
1307	Depot Quartermaster...	47	35	51	44	13,200
973	Metropolitan Club.....	48	44	53	48	14,400
321	Albright & Barker.....	55	43	48	49	14,700
408	Boston House.....	44	52	60	52	15,600
450	Knox Express Co.....	47	58	53	53	15,900
1311	Penn Freight.....	48	44	74	55	16,500
1472	Cockerill & Co.....	75	71	72	73	21,900
1 8	B. & O. Freight.....	70	62	109	80	24,900
1480	W. B. Moses & Son.....	104	99	112	105	31,500

102

Name.	Trunk Line numbers.	Average calls Daily.	Total Average Daily.	Average calls annually (300 days)
U. S. Senate	277	4		
" "	1093	11		
" "	646	11		
" "	1052	22	48	14,400
Navy Yard	1638	27		
" "	1652	19	46	13,800
National Museum	331	23		
" "	1812	21	44	13,200
Post Office Dept	1410	29		
" " "	510	23	52	15,600
Govt. Printing Office	333	26		
" " "	470	15		
" " "	1655	11		
" " "	1863	16	68	20,400
Library of Congress	1503	44	44	13,200
Dept. of Agriculture	248	11		
" " "	1848	23	34	10,200
Treasury Department	890	41		
" "	920	58		
" "	430	36		
" "	1258	43		
" "	298	23	201	60,300
Interior Department	242	13		
" "	308	21		
" "	800	26	60	18,000
House of Representatives	262	2		
" " "	292	½		
" " "	512	12		
" " "	625	12		
" " "	785	11	37½	11,200

103 For Defendants' EXHIBIT "P."

See Defendants' Exhibit No. 5, page..... 66

104 EXHIBIT "Q."

Summary showing the proportion of earnings from operation assignable to passenger and freight service, and the percentage of operating expenses to operating income, by groups.

(*Extract from the Report of the Interstate Commerce Commission for the year ending June 30, 1896.*)

Territory covered.	Earnings from operation.				Percentage of operating expenses to operating income.						
	Passenger.	Freight.	Other.	Unclassified.	1896.	1895.	1894.	1893.	1892	1891.	1890.
	Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct*	*Per ct.*	*Per ct.*	*Per ct.*
Group 1	46.74	52.37	0 89	0.02	69.95	68.27	69.33	69.97	69 58	69.50	67.76
Group 2	27.13	70 45	2.41	.01	66 53	66 03	65.66	65 87	65.36	64.49	64 92
Group 3	27.92	70.18	1.90	.....	71.39	70.84	73.04	71.84	70 43	69.33	68.36
Group 4	27.46	70 74	1 69	.11	68.49	69.50	71.03	69.40	68.57	66.67	67.44
Group 5	48.27	49.04	2.41	.28	68.83	68.30	67.76	71.52	70.16	68 95	66.29
Group 6	25 70	70.69	3.51	.10	69.80	62 78	63.65	64 69	62.84	64.16	63.98
Group 7	26.13	71 72	2.15	.....	65 03	68.17	68.44	64 68	61.78	63 57	58.64
Group 8	26.21	69.89	3 88	.02	69.70	70.38	71.99	68.59	66 73	69.26	64.43
Group 9	25.86	72.23	1.91	*a*	76.77	71.28	76.47	75.70	78 42	77.90	75.70
Group 10	33.26	64.61	2.14	.....	65.55	70.03	67 93	64.98	63.04	63.62	66.32
United States	28.74	68.73	2.48	.05	67.20	67.48	68.14	67.82	66 67	66 73	65.80

a Less than 0.01 per cent.

105 EXHIBIT "R."

THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY,

Washington, D. C., February 23, 1898.

The BOARD OF DIRECTORS
OF THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.

GENTLEMEN: I have the honor to make the following report of the operations of the company for the year ended December 31, 1897:

The gross earnings for the year were $531,471.88, as against $508,217.68 for 1896, an increase of $23,254.20, or 4.57 per cent.

The net earnings for the year were $124,582.49, as against $115,015.28 for the year 1896, an increase of $9,567.21, or 8.32 per cent.

Extra-territorial and toll, real estate, and miscellaneous receipts for the year were $40,052.50, as against $34,155.49 for the preceding year, an increase of $5,897.01.

Our real-estate investment in Baltimore and leased building in Washington have yielded a net revenue of $3,988.33, an increase, as compared with the preceding year, of $604.67. These figures include the rental allowed for those portions of the Baltimore and Washington buildings reserved for the company's use.

The total number of exchange stations in Washington is 2,153, of which 827 are metallic circuit and 1,326 are grounded circuit.

The total number of exchange stations in Baltimore is 3,069, of which 1,469 are metallic circuit and 1,600 are grounded circuit.

The total number of exchange stations in western Maryland, including Annapolis, is 372, of which 238 are metallic circuit and 134 are grounded circuit.

Making the whole number of exchange stations in the territory 5,594, of which 2,534 are metallic circuit and 3,060 are grounded circuit.

The increase in our metallic-circuit stations over those in operation at the beginning of the year is as follows:

Washington	512
Baltimore	494
Western Maryland	111
Total increase	1,117

The amount added to construction equipment and construction during the year 1897 was $39,654.28, as follows:

Construction equipment	$16,875.25
Aerial cables in Baltimore	3,303.81
Toll lines, Maryland division	19,475.22

The expenses during the year which might be termed extraordinary amount to $27,280.90, made up as follows:

Aerial cables in Washington	$1,267.51
Reconstruction of a portion of Washington underground system, which is a change from the solid to the drawing-in system	21,398.85
Rebuilding the line on the right of way of the Postal Telegraph Company on Woodley road	2,577.94
Moving Hagerstown exchange	1,353.53
Rebuilding line from Boonesboro to Sharpsburg, Md., within the Hagerstown limits	683.07

The long toll line connecting Baltimore with Cumberland, by way of Westminster, Frederick, and Hagerstown, was completed as to that portion between Hagerstown and Cumberland 68 miles, and opened to the public for business on November 9, 1897.

During the year the company purchased, at a cost of $6,000, a large lot in Washington, on which it proposes at an early date to begin the erection of a building for wareroom and storage purposes.

Attached hereto will be found the financial and other reports, showing the business of the company in detail, all of which are respectfully submitted.

Very respectfully,

_____,
President.

THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY,

Washington, D. C., *January* 31, 1898.

DEAR SIR: I beg to submit this report, showing the amount of construction for the entire territory, and also a statement of the work done during the year ended December 31, 1897:

In Washington and its territory there are as follows:

89,160 feet of 100-pair, No. 19 gauge, Patterson underground cable.
39,566 feet of 50-pair, No. 19 gauge, Patterson underground cable.
15,252 feet of 50-pair, No. 18 gauge, Patterson underground cable.
936 feet of 25-pair, No. 19 gauge, Patterson underground cable.
100 feet of 10-pair, No. 19 gauge, Patterson underground cable.

145,014 total feet of underground cable.
23,362,600 total feet of conductor in underground cable.
4,424.7 total miles of conductor in underground cable.
27.5 total miles of cable.
6,807 feet of 25-pair, No. 19 gauge, Patterson aerial cable.
340,350 feet of No. 19-gauge Patterson aerial conductor.

64.5 miles of conductor in aerial cables.
1.3 miles of aerial cable.
151,821 total number of feet of cable of all kinds.
28.76 miles of cable of all kinds.
23,702,950 total number of feet of conductor of all kinds.
4,489.2 total number of miles of conductor of all kinds.

The main subways contain the following ducts:

76 feet of 72-duct capacity, containing 5,472 feet of duct.
176 feet 3 inches of 64-duct capacity, containing 11,280 feet of duct.
748 feet 9 inches of 56-duct capacity, containing 41,930 feet of duct.
1,534 feet 5 inches of 40-duct capacity, containing 61,376 feet 8 inches of duct.
26 feet of 36-duct capacity, containing 936 feet of duct.
465 feet 6 inches of 32-duct capacity, containing 14,896 feet of duct.
304 feet 6 inches of 25-duct capacity, containing 7,612 feet 6 inches of duct.
2,072 feet 1 inch of 24-duct capacity, containing 49,730 feet of duct.
26 feet of 20-duct capacity, containing 520 feet of duct.
1,576 feet 3 inches of 18-duct capacity, containing 28,372 feet 6 inches of duct.
636 feet of 17-duct capacity, containing 10,812 feet of duct.
5,824 feet 9 inches of 16-duct capacity, containing 93,196 feet of duct.
212 feet of 13-duct capacity, containing 2,756 feet of duct.
4,963 feet 2 inches of 12-duct capacity, containing 59,558 feet of duct.
114 feet of 9-duct capacity, containing 1,026 feet of duct.
18,085 feet 1½ inches of 8-duct capacity, containing 144,381 feet of duct.
82 feet 6 inches of 7-duct capacity, containing 577 feet 6 inches of duct.
23,005 feet 3 inches of 6-duct capacity, containing 138,391 feet 6 inches of duct.
348 feet 11 inches of 4-duct capacity, containing 1,395 feet 8 inches of duct.
60,337 feet 5½ inches total length of trench, containing 674,519 feet 4 inches.

The branch subways contain—

2,759 feet 2 inches of 2-duct capacity in streets, containing 5,518 feet 4 inches of duct.
4,757 feet of 1-duct capacity in streets, containing 4,757 feet of duct.
1,175 feet 9 inches of 2-duct capacity in alleys, containing 2,351 feet 6 inches of duct.
10,723 feet 5 inches of 1-duct capacity in alleys, containing 10,723 feet 5 inches of duct.
19,415 feet 4 inches total length of branch trench, containing 23,350 feet 3 inches of duct.

1081 TOTAL FOR CITY.

Total of trench subway, 79,752 feet 9½ inches, containing 697,869 feet 7 inches of duct, of which 234,174 feet is occupied by cables.

Total miles of trench subway, 15.1, containing 132.2 miles of duct.

There are 182 "B" manholes, 41 "A" manholes.

There are 1,400 poles in the city limits, 3,627 in the county, in this division; total, 5,027 in this division, or 143.6 miles of pole line; an increase of 783 poles up. Housetop fixtures up, 8; bridge fixtures up, 26.

There are at present 2,818.3 miles of line wire on poles, 45 miles of line wire on housetops; total, 2,863.3 miles of aerial line wire up, making a total of 7,352.5 miles of wire of all kinds; making an increase of 1,511.2 miles of wire of all kinds for the year.

500 miles of the aerial wire is No. 12 N. B. S. copper.
897 miles of the aerial wire is No. 12 B. & S. copper.
1,457.3 miles of the aerial wire is iron and steel.

2,863.3 total aerial line wire.

There is provision for 56-100 pair cables to enter exchange. There are 23-100 pair cables entering exchange at present, containing 4,000 wires, of which 2,000 are in use.

WORK DONE IN 1897.

During the year there were 94 new poles set in the city limits, 691 new poles set in the county, 130 old poles replaced with new ones in the city, 21 old poles replaced with new ones in the county, 2 old poles abandoned in the city, being of no further use, 59 poles moved on account of improvements, etc., making an increase of 783 poles during the year.

Have put up 796.5 miles of line wire, of which 325.5 miles is No. 12 B. & S. copper, 246 miles is No. 12 N. B. S. copper, and 225 miles is iron and steel.

Have taken down 175.5 miles of line wire, of which 19.5 miles is No. 12 B. & S. copper, 12 miles is No. 12 N. B. S. copper, and 144 miles is iron and steel, making an increase of 621 miles of line wire for the year.

Have put up 26 bridge fixtures.

Have drawn in the following cable: 23,930 feet of 100-pair 19-gauge, 2,503 feet of 50-pair 19-gauge, 2,844 feet of 50-pair 18-gauge, 386 feet of 25-pair 19-gauge Patterson underground cable; total, 29,663 feet of underground cable drawn in, in 1897; 6,890 feet of 25-pair 19-gauge aerial cable put up in 1897.

Have drawn out 814 feet of 50-pair 18-gauge Patterson underground cable; 83 feet of 25-pair 19-gauge Patterson aerial cable; total, 897 feet of cable drawn out in 1897.

Have abandoned 5,728 feet of 100-wire 20-gauge, 6,525 feet of 50-wire 20-gauge Patterson underground cable; total, 12,253 feet of grounded wire cable abandoned, containing 869,050 feet of conductor.

This cable was in the solid system, and is abandoned on account of having been replaced by metallic cable in the new conduits.

CONDUIT LAID IN 1897.

Main subways, 3,614 feet 11 inches, of 8-duct capacity, containing 28,919 feet 4 inches; 3,106 feet 10 inches, of 6-duct capacity, containing 18,641 feet; 283 feet 5 inches, of 4-duct capacity, containing 1,133 feet 8 inches. Total length of trench, 7,005 feet 2 inches, containing 48,694 feet.

Branches, streets, 863 feet 8 inches, of 2-duct capacity, containing 1,727 feet 4 inches; 138 feet 9 inches, of 1-duct capacity, containing 138 feet 9 inches. Total length of trench, 1,002 feet 5 inches, containing 1,866 feet 1 inch.

Branches, alleys, 175 feet 1 inch, of 2-duct capacity, containing 350 feet 2 inches; 799 feet 1 inch, of 1-duct capacity, containing 799 feet 1 inch. Total length of trench, 974 feet 2 inches, containing 1,149 feet 3 inches.

Total laid in 1897, 8,981 feet 9 inches of trench, containing 51,709 feet 4 inches; 30 new "B" manholes constructed.

Abandoned main subways, 51 feet 1 inch of 6-duct capacity, containing 306 feet 6 inches.

Abandoned branches (streets), 47 feet 5 inches of 2-duct capacity, containing 94 feet 10 inches; 46 feet 11 inches of 1-duct capacity, containing 46 feet 11 inches.

Abandoned branches (alleys), 27 feet of 1-duct, 27 feet of duct.

Have abandoned 9,045 feet of asphalt conduit, containing 12,590 feet of asphalt duct, on account of the cables occupying these ducts being abandoned.

In Washington there are the following toll lines:

Location of line.	Length.	Number of wires.	Miles of toll pole line.	Miles of toll wire.
Washington to Laurel, Md.	22	4 pairs	22	176
Washington to Waterloo, Va.	5	3 pairs	5	30
Washington to Takoma Park, D. C.	6	1 pair	.....	12
Washington to Hyattsville, Md.	7	1 wire	3	7
Washington to Rockville, Garrett Park and Kensington, Md.	19	1 pair	19	38
Total	.....	.....	49	263

This toll pole line and toll wire is included in the statement of poles and wire hereinbefore mentioned.

Wires and subscribers connected with the Washington exchange December 31, 1897.

	Wires.	Stations.
GROUNDED CIRCUITS.		
Special	1,174	1,182
Semispecial, 1 station	13	13
Semispecial, 2 stations	30	60
General, 1 station	5	5
General, 3 stations	5	15
General, 4 stations	2	8
General, 6 stations	1	6
Government Department switch boards, trunks	8	19
Total	1,238	1,308
METALLIC CIRCUIT.		
Lines of 1 station	443	443
Lines of 2 stations	43	86
Lines of 4 stations	3	12
Pay stations	113	132
Government Department switch boards, trunks	16	163
Total	618	836
Total exchange subscribers	1,856	2,144
C. and P. trunks to Baltimore	4	.....
C. and P. trunks to Alexandria, Va	3	.....
A. T. and T. trunks to Baltimore	4	.....
A. T. and T. trunks to New York	1	.....
A. T. and T. trunks to Manchester, Va	1	.....
A. T. and T. terminal-loop subscribers	6	.....
Total	19	6
Total lines and stations connected with the exchange	1,875	2,150

MARYLAND DIVISION.

In Baltimore there are 635 feet of 100-pair 19-gauge, 20,570 feet of 100-pair 18-gauge, 179,475 feet of 50-pair 18-gauge, 8,720 feet of 50-pair 19-gauge Patterson underground cable.

In Baltimore there are 401 feet of 25-pair 18-gauge, 365 feet of 15-pair 19-gauge, total 210,106 feet of Patterson underground cable; 39.8 total miles of Patterson underground cable, 23,091,500 total feet of Patterson underground conductor, 4,373.4 total miles of Patterson underground conductor; 700 feet of 25-pair 19-gauge Patterson aerial cable, 35,000 feet of conductor in 19-gauge Patterson aerial cable, 6.6 miles of conductor in 19-gauge Patterson aerial cable.

The main subways contain the following ducts:

544 feet 6 inches of 72-duct capacity, containing 39,204 feet of duct.
60 feet of 50-duct capacity, containing 3,000 feet of duct.
140 feet 6 inches of 42-duct capacity, containing 5,901 feet of duct.
9 feet of 38-duct capacity, containing 3,610 feet of duct.
3,593 feet 7 inches of 36-duct capacity, containing 129,369 feet of duct.
919 feet 11 inches of 30-duct capacity, containing 31,127 feet 6 inches of duct.

3,443 feet 2 inches of 24-duct capacity, containing 82,636 feet of duct.
1,172 feet of 20-duct capacity, containing 23,440 feet of duct.
107 5,281 feet 4 inches of 18-duct capacity, containing 95,064 feet of duct.
10,285 feet 7 inches of 12-duct capacity, containing 123,427 feet of duct.
2,076 feet 11 inches of 8-duct capacity, containing 16,615 feet 4 inches of duct.
27,009 feet 9 inches of 6-duct capacity, containing 162,058 feet 6 inches of duct.
537 feet 6 inches of 2-duct capacity, containing 1,075 feet of duct.
55,073 feet 9 inches total main subway trench, containing 716,527 feet 4 inches of duct.

The branch subways contain:

124 feet of 6-duct capacity in branches streets, containing 744 feet duct.
3,434 feet 1 inch of 2-duct capacity in branches streets, containing 7,096 feet 2 inches duct.
83 feet 3 inches of 1-duct capacity in branches streets, containing 188 feet 3 inches duct.
443 feet 1 inch of 2-duct capacity in branches alleys, containing 886 feet 2 inches duct.
4,084 feet 5 inches total length of trench branches, containing 8,914 feet 7 inches duct.

Total for city: 59,158 feet 3 inches total length of trench, containing 725,341 feet 11 inches of duct, of which 210,166 feet is occupied by cables; 11.2 miles of trench, containing 137.3 miles of duct, 69 feet of tunnel, 51 "A" manholes, 106 "B" manholes.

There is provision for 180 50-pair cables to enter the exchange. There are 68 50-pair cables entering the exchange at present, containing 6,800 wires, of which 4,490 are in use.

There are 1,950 poles in the city limits and 3,686 in the county, making a total of 5,636 poles in this territory, or 161 miles of pole line.

There are 38 house-top fixtures. There are 3,215.7 miles of line wire up, of which 561.2 miles is of No. 12 N. B. S. copper, 2,234.6 miles of No. 12 B. & S. copper, 419.9 miles is of iron and steel; 325 miles of this wire is on buildings, making the total amount of wire, both underground and aerial, 7,595.7.

WORK DONE IN 1897.

During the year there were set 52 new poles in the city, 25 in the county; replaced on account of being too short or decayed, 124 in the city, 113 in the county; moved on account of improvements, etc., 35, making an increase for the year of 77 poles.

Have put up 753.4 miles of wire, of which 549.9 miles is of No. 12 B. & S. copper; 130.1 miles is of No. 12 N. B. S. copper, and 73.4 miles is of iron and steel.

Have taken down 720.4 miles of wire, of which 7.2 miles is of No. 12 N. B. S. copper and 577.4 miles is of No. 12 B. & S. Copper, and 135.8 miles is of iron and steel wire, making an increase of 33 miles of wire up for the year.

Have laid 210 feet of 19-gauge 50-pair and 550 feet of 19-gauge 100-pair Patterson underground cable, and 700 feet of 25-pair 19-gauge aerial cable.

Have replaced 1,020 feet of 18-gauge 50-pair Patterson cable with 1,020 feet of 19-gauge 50-pair Patterson cable.

New conduits have been constructed during the year as follows: 109 feet 8 inches of 2-duct conduit, 33 feet of 1-duct conduit. At South and German streets, 1 "B" manhole.

In Baltimore there are the following toll lines:

Location of line.	Length of line.	Wires.	Toll pole line.	Toll wire
	Miles.		*Miles.*	*Miles.*
Baltimore to Laurel	23	5 pairs...	23	230
Baltimore to Jessups	16	1 pair.....	1	36
Baltimore to Reisterstown	16	4 pairs...	16	128
Baltimore to Annapolis	40	1 pair.....	22	80
Baltimore to Arlington	5	1 pair.....	1	10
Baltimore to Catonsville	8.7	1 pair.....	8.7	17.4
Baltimore to Ellicott City	14.4	1 pair.....	4.5	28.8
Baltimore to Waverly	3	1 pair.....	0	6
Baltimore to Govanstown	6	1 pair.....	1	12
Baltimore to Luthersville	10.4	3 pairs....	10.4	62.4
Baltimore to Towson	9.5	1 pair.....	0	19
Baltimore to Mount Washington	7.3	1 pair.....	3	14.6
Baltimore to Roland Park	5	1 pair.....	1	10
Baltimore to Woodbury	8.3	1 pair.....	3.8	7.6
Baltimore to Butschky's Hotel	11	1 pair.....	9	22
Total			104.4	683.8

This toll pole line and toll wire is included in the statement of poles and wire hereinbefore mentioned.

CUMBERLAND, FROSTBURG AND LONACONING.

Number of feet 50-pair 19-gauge Patterson aerial cable	52
Number of poles up	1,963
Number of miles of pole line	58.3
Number of miles of wire up, of which 98 miles is N. B. S. copper	242.7
Number of feet of 25-pair 19-gauge Patterson aerial cable up	1,510
Number of feet of conductor in Patterson aerial cable up	80,700
Number of miles of conductor in Patterson aerial cable up	15.2
Number of poles set in 1897	1,028
Number of poles replaced in 1897	1,010
Number of poles abandoned in 1897	90
Number of miles of wire put up in 1897, of which 98 miles is No. 12 N. B. S. copper	108
Number of miles of wire taken down in 1897	10
Number of feet of 50-wire 22-gauge aerial cable taken down in 1897	410

In Cumberland there are the following toll pole lines and wires:

Location of line.	Wires.	Toll pole line.	Toll wire.
		Miles.	*Miles.*
Cumberland to Washington County line	1 pair	29.5	59
Cumberland to Lonaconing	2 pair	19.0	76
Frostburg to Mount Savage	1 pair, 4.5 miles	0	9
Frostburg to Eckhart	1 pair	0	3
Lonaconing to Pompey	1 wire	0	8
Total		48.5	155

FREDERICK, MD.

Number of poles up	2,270
Number of miles of pole line	75
Number of feet of 50-pair 18-gauge Patterson underground cable	162
Number of feet of conductor in Patterson underground cable	16,200
Number of miles of conductor in Patterson underground cable	3
Number of miles of wire up (of which 67 is No. 12 N. B. S. copper)	313.5
Number of poles set in 1897	0
Number of poles replaced in 1897	43
Number of poles taken down in 1897	172
Number of miles of wire put up in 1897 (of which 0 is No. 12 N. B. S. copper)	29
Taken down in 1897	16.5

In Frederick there are the following lines and wires:

Location of line.	Wires.	Toll pole line.	Toll wire.
		Miles.	*Miles.*
Frederick to Washington County line	2 pairs	13	52
Frederick to Myersville	1 pair	4	26
Frederick to Carroll County line	2 pairs, 20 miles	20	80
Frederick to Johnsville	1 pair	0	40
Frederick to Walkersville	1 wire	3	7
Frederick to Adamstown	1 wire	9	9
Total		49	214

HAGERSTOWN, MD.

Number of feet of 2-duct conduit laid	300
Number of feet of 2-duct in conduit laid	600
Number of "B" manholes	2
Number of feet of 25-pair 19-gauge Patterson aerial cable	400
Number of feet of conductor in Patterson aerial cable	20,000
Number of miles of conductor in Patterson aerial cable	4
Number of feet of 100-pair 19-gauge Patterson underground cable	200
Number of feet of 50-pair 19-gauge Patterson underground cable	240
Number of feet of conductor in Patterson underground cable	64,000
108 Number of miles of conductor in Patterson underground cable	10.5
Number of poles up	2,617
Number of miles of pole line	78
Number of miles of wire up (of which 138 is No. 12 N. B. S. copper)	323
Number of poles set in 1897	1,176
Number of poles replaced in 1897	325
Number of poles abandoned in 1897	75
Number of miles of wire put up in 1897 (of which 92.5 is No. 12 N. B. S. copper)	128.5
Number of miles of wire taken down in 1897	6
Number of feet of 2-duct conduit laid in 1897	300
Number of feet of 2-duct laid in 1897	600
Number of "B" manholes built in 1897	2
Number of feet of 100-pair 19-gauge Patterson underground cable laid in 1897	200
Number of feet of 50-pair 19-gauge Patterson underground cable laid in 1897	240
Number of feet of 25-pair 19-gauge Patterson aerial cable, put up in 1897	400
Number of feet of 50-pair 19-gauge Patterson underground cable taken down in 1897	240

There are the following toll lines in Hagerstown:

Location of line.	Wires.	Toll pole line.	Toll wire.
		Miles.	*Miles.*
Hagerstown to Allegany County line	1 pair, 38.5 miles.	38.5	77
Hagerstown to Williamsport	1 pair, 6.5 miles.	0	13
Hagerstown to Frederick County line	2 pairs, 15.5 miles.	15.5	62
Hagerstown to Pennsylvania line	1 pair	9	18
Hagerstown to Smithsburg	1 pair	3	20
Hagerstown to Sharpsburg	1 pair	6.5	37
Total		72.5	227

WESTMINSTER, MD.

Number of feet of 50-pair 18-gauge Patterson aerial cable up	35
Number of feet of conductor in Patterson aerial cable up	3,500
Number of miles of conductor in Patterson aerial cable up	.7
Number of poles up	1,469
Number of miles of pole line	44.5
Number of miles of wire up (of which 111.5 is No. 12 N. B. S. copper)	190
Number of poles set in 1897	15
Number of poles replaced in 1897	0
Number of miles of wire put up in 1897 (of which 14.5 is No. 12 N. B. S. copper)	18
Number of miles of wire taken down in 1897	3.5
Number of poles taken down in 1897	0

There are the following toll pole lines in Westminster:

Location of line.	Wires.	Toll pole line.	Toll wire.
		Miles.	*Miles.*
Westminster to Frederick County	2 pairs, 12.5 miles.	12.5	50
Westminster to Reisterstown	3 pairs, 12 miles.	12	72
Westminster to Manchester	1 wire	9.5	10
Westminster to Union Bridge	1 pair	0	10
Westminster to Taneytown	1 pair, 14 miles.	6	28
Total		40	170

MARTINSBURG, W. VA.

Number of poles up	109
Number of miles of pole line	3.5
Number of miles of wire up	18.7
Number of feet of 50-pair 19-gauge Patterson aerial cable	45
Number of feet of conductor in Patterson aerial cable	4,500
Number of feet of conductor in Patterson aerial cable	.8
Number of poles set in 1897	0
Number of poles replaced in 1897	0
Number of miles of wire put up in 1897	0

ANNAPOLIS, MD.

Number of feet of 50-pair 19-gauge Patterson aerial cable	105
Number of feet of conductor in Patterson aerial cable	10,500
Number of miles of conductor in Patterson aerial cable	2
Number of poles up	83
Number of miles of pole line	2.8
Number of miles of wire up (of which 2 are No. 12 N. B. S. copper)	15
Number of poles set in 1897	8
Number of miles of wire put up in 1897 (No. 12 N. B. S. copper)	1.5
Number of miles of wire taken down in 1897	0

MOUNT WASHINGTON, MD.

Number of poles up	37
Number of miles of pole line	2
Number of miles of wire up	12.5
Number of poles set in 1897	0
Number of poles abandoned in 1897	0
Number of miles of wire put up in 1897	0

This is managed by Mr. M. B. Cockran.

LUTHERVILLE, MD.

Number of feet of 50-pair 19-gauge Patterson underground cable	89
Number of feet of conductor in Patterson underground cable	8,900
Number of miles of conductor in Patterson underground cable	1.7
Number of poles up	882
Number of miles of pole line	29.5
Number of miles of wire up	148
Number of poles set in 1897	0
Number of poles abandoned in 1897	0
Number of miles of wire put up in 1897	5
Number of miles of wire taken down in 1897	5
Number of feet of 50-pair 19-gauge underground cable laid in 1897	89
Containing miles of conductor	1.7

This is managed by Mr. M. B. Cockran.

TOTALS FOR THE ENTIRE TERRITORY.

Poles up	20,122
Miles of pole line	598.2
Miles of line wire	7,299.9
Feet of aerial cable	9,654
Miles of aerial conductor	90.2
Feet of underground cable	355,871
Miles of underground cable	67.3
Feet of underground conductor	46,534,200
Miles of underground conductor	8,813.3
Miles of wire of all kinds	15,753.3
Feet of trench conduit	139,210.11½
Miles of trench conduit	26.3
Feet of duct	1,423,811.6
Miles of duct	269.5
"A" manholes	92
"B" manholes	200
Feet of tunnel	69
Housetop fixtures	46

Total toll lines.

	Toll pole line.	Toll wire.
	Miles.	*Miles.*
Washington, D. C.	49	263
Baltimore, Md.	104.4	283.8
Frederick, Md.	49	214
Hagerstown, Md.	72.5	227
Westminster, Md.	40	170
Cumberland, Md.	48.5	155
Total	363.4	1,712.8

109 *Total work done in 1897 for the entire territory.*

New poles set	3,089
Poles replaced	966
Poles abandoned	249
Poles moved	94
Miles of wire put up	1,839.9
Miles of wire taken down	936.9
Feet of cable laid	40,452
Feet of cable replaced	1,020
Feet of underground cable abandoned	13,150
Feet of aerial cable abandoned	650
Trench conduit laid	9,524 feet 5 inches
Duct laid	52,561 feet 8 inches
"B" manholes built	33
Conduit abandoned	9,096 feet 1 inch
Duct abandoned	12,896 feet 6 inches

On the following pages are condensed comparative statements as to the entire territory, for your convenience.

Totals for the entire territory.

	Poles up.	Pole line.	Line wire.	Aerial cable.	Aerial conductor.	Underground cable.	Underground cable.
				Feet.	*Miles.*	*Feet.*	*Miles.*
Baltimore	5,636	161	3,215.7	700	6.6	210,166	39.8
Cumberland	1,963	58.3	242.7	1,562	15.2	0	0
Frederick	2,279	75	301	0	0	162	0
Hagerstown	2,617	78	323	400	.4	440	0
Westminster	1,469	44.5	190	35	.7	0	0
Martinsburg	109	3.5	18.7	45	.8	0	0
Annapolis	83	2.8	15	105	2	0	0
Mount Washington	57	2	12.5	0	0	0	0
Lutherville	882	29.5	148	0	0	89	0
Total Maryland division	15,095	454.6	4,466 6	2,847	25.7	210,857	39.8
Total Washington	5,027	143.6	2,863.3	6,807	64.5	145,014	27.5
Total for the entire territory	20,122	598.2	7,299 9	9,654	90.2	355,871	67.3

	Underground conductor.	Underground conductor.	Wire of all kinds.	Trench conduit.	Trench conduit.	Duct.
	Feet.	*Miles.*	*Miles.*	′ ″	*Miles.*	′ ″
Baltimore	23,091,500	4,373.4	7,595.7	59,158 2	11.2	725,341 11
Cumberland	0	0	287.9	0	0	0
Frederick	16,200	3	316.5	0	0	0
Hagerstown	64,000	10.5	337.5	300 0	0	600 0
Westminster	0	0	190.7	0	0	0
Martinsburg	0	0	19 5	0	0	0
Annapolis	0	0	17	0	0	0
Mount Washington	0	0	12.5	0	0	0
Lutherville	8,900	1.7	149.7	0	0	0
Total Maryland division	23,180 600	4,388.6	8,897	59,458 2	11.2	725,941 11
Total Washington	23,362.600	4,424.7	6,856.3	79,752 9½	15.1	697,869 7
Total entire territory	46,543,200	8,813.3	15,753.3	139,210 11½	26.3	1,423,811 6

	Duct.	"A" manholes.	"B" manholes.	Tunnel.	House top fixtures.
	Miles.			*Ft. In.*	
Baltimore	137.3	51	108	69 0	38
Cumberland	0	0	0	0	0
Frederick	0	0	0	0	0
Hagerstown	0	0	2	0	0
Westminster	0	0	0	0	0
Martinsburg	0	0	0	0	0
Annapolis	0	0	0	0	0
Mount Washington	0	0	0	0	0
Lutherville	0	0	0	0	0
Total Maryland division	137.3	51	108	69 0	38
Total Washington	132.2	41	182	0	8
Total entire territory	269.5	92	290	69 0	46

	Toll pole line.	Toll wire.
	Miles.	*Miles.*
Baltimore	104.4	683.8
Frederick	49	214
Hagerstown	77.5	227
Westminster	40	170
Cumberland	48.5	155
Total in Maryland division	314.4	1,449.8
Washington	49	263
Total for entire territory	363.4	1,712.8

Total work done in 1897.

	Poles set.	Poles replaced.	Poles abandoned.	Poles moved.	Wire put up.	Wire taken down.
					Miles.	*Miles.*
Baltimore	77	237	0	35	753.4	730.4
Cumberland	1,028	10	0	0	108	10
Frederick	0	45	172	0	29	16.5
Hagerstown	1,176	825	75	0	128.5	6
Westminster	15	0	0	0	18	3.5
Martinsburg	0	0	0	0	0	0
Annapolis	8	0	0	0	1.5	0
Mount Washington	0	0	0	0	0	0
Lutherville	0	0	0	0	5	5
Total Maryland division	2,304	615	247	35	1,043.4	761.4
Total Washington	785	351	2	59	796.5	175.5
Entire territory	3,089	966	249	94	1,839.9	936.9

	Cable laid.	Cable replaced and drawn out.	Cable abandoned.
	Feet.	*Feet.*	*Feet.*
Baltimore (aerial)	700		
Baltimore (underground)	760	1,020	0
Cumberland (aerial)	1,510	0	410
Frederick	0	0	0
Hagerstown (aerial)	400		
Hagerstown (underground)	440	0	240
Westminster	0	0	0
Martinsburg	0	0	0
Annapolis	0	0	0
Mount Washington	0	0	0
Lutherville	89	0	0
Total Maryland division	3,899	1,020	650
Total Washington (aerial)	6,890	0	met. 897
Total Washington (underground)	[illegible]	0	gsd. 12,253
Total entire territory	40,452	1,020	13,800

Treasurer's statement for year ended December 31, 1897.

REVENUE.

Exchange service	$471,430.18
Toll service	20,773.38
Private line	16,933.61
Messenger	774.32
Real estate revenue	9,416.84
Dividends and interest	2,239.46
Miscellaneous revenue	9,904.09
Total	531,471.88

110 EXPENSES.

General	$81,179.59	
Operating	62,258.00	
Maintenance	190,646.87	
Telephone rental and switch-board royalty (not including private line)	39,373.29	
Private line, instrument rental, etc.	2,975.11	
Messenger expense	1,217.38	
Real estate expense	5,460.33	
Interest	23,778.82	
		$406,889.39
		124,582.49

Disposition of net revenue:	
Dividends on capital stock	106,000.00
Surplus	18,582.49

BALANCE SHEET, DECEMBER 31, 1897.

ASSETS.

Franchise	$692,600.00
Construction	2,782,976.41
Real estate	162,983.55
Sinking fund	111,900.00
Supplies	40,972.01
Accounts receivable	37,554.87
Cash	2,769.87
Stocks and bonds	16,527.91
	3,848,284.62

LIABILITIES.

Capital stock	2,650,000.00
Bonded debt	500,000.00
Surplus	629,437.32
Accounts payable	53,901.81

RESERVE.

For unearned rentals	$7,259.40	
For outstanding toll tickets and tokens	31.30	
For accrued interest	2,293.24	
For office rent	361.55	
		9,945.49
Real estate mortgage notes		5,000.00
		3,848,284.62

Expended for construction in 1897:	
Exchange aerial	3,303.81
Underground conduits	
Underground cables	
Equipment	16,875.25
Toll lines	19,475.22
	39,654.28

Comparative statement.

	1894.	1895.	1896.	1897.
Gross revenue	$463,934.64	$490,273.32	$508,217.68	$531,471.88
Gross expenses	354,304.31	369,848.79	393,202.40	406,889.39
Net revenue	109,630.33	120,424.53	115,015.28	124,582.49
Dividends	53,000.00	53,000.00	79,500.00	106,000.00
Surplus	56,630.33	67,424.53	35,515.28	18,582.49
Construction	53,984.72	32,205.14	18,164 46	39,654.28

111 *Memorandum.*

For Defendants' Exhibit No. 101.

See Defendant's Testimony, page.....615

For Defendants' Exhibit No. 102.

See Defendants' Testimony, page.....633

112 EXHIBIT, "BETHEL No. 1." Cause and Effect.

Rates for Telephone Service and Number of Telephone Stations in New York City, 1893-1899.

Dates.	Rates.	Total Number of Stations.
Jan. 1, 1893,	$150 grounded circuit, $240 metallic circuit.....	9093
Jan. 1st, 1894,	Same as above	9981
June 1st, 1894,	Message rates adopted; 1000 messages $150, with direct metallic circuit line.....	10065
Nov. 1894,	Minimum rate reduced to $120 for 700 messages....	10254
Jan. 1st, 1895,	No further change in rates.....	10435
June 1st, 1895,	Minimum rate reduced to $90 for 600 messages.....	11627
Jan. 1st, 1896,	Various rate reductions.....	13369
Jan. 1st, 1897,	Various rate reductions and additional facilities offered.....	16786
July 1st, 1897,	Price of extra messages reduced.	18943
Jan. 1st, 1898,	Various minor rate reductions.....	21535
Jan. 1st, 1899,	No further change in rates.....	27007
Apr. 20th, 1899,	Minimum rate reduced to $75 for 600 messages, and reductions made in the price of extra messages...	29754
June 1st, 1899,	.....	31241

During the five years since the adoption of message rates the system has increased by over 310 per cent.

113 EXHIBIT, "BETHEL No. 2."

Disappearance of the Grounded Circuit System.

	Number of Stations.		
	Grounded Circuit.	Metallic Circuit.	Total
January 1st, 1893	5537	3556	9093
January 1st, 1894	3956	5955	9911
June 1st, 1894	2544	7521	10065
MESSAGE RATES INTRODUCED.			
January 1st, 1895	802	9633	10435
January 1st, 1896	9	13360	13369
January 1st, 1897	0	16786	16786
January 1st, 1898	0	21535	21535
January 1st, 1899	0	27007	27007
June 1st, 1899	0	31241	31241

NOTE.—The Berlin Telephone System, the largest telephone system outside the United States, is still entirely grounded Circuit.

114 EXHIBIT, "BETHEL No. 3."

Increase of Telephone Stations in New York Before and After the Adoption of Message Rates.

	Number of Stations.	Yearly Increase	Percentage of Increase
January 1st, 1893	9093	.....	.....
January 1st, 1894	9981	888	9.76
January 1st, 1895	10435	454	4.55
January 1st, 1896	13369	2934	28.12
January 1st, 1897	16786	3417	25.56
January 1st, 1898	21535	4749	28.3
January 1st, 1899	27007	5472	25.17
June 1st, 1899	31241	4234*	15.68*

* Increase for five months.

The first message rate schedule was introduced in June, 1894. The year of 1894 was one of extreme business depression. The greater proportion of the increase of stations for that year occurred after the adoption of message rates. The schedule of rates underwent substantial reductions in November, 1894, and again in June, 1895. It will be noticed that the number of stations slightly more than doubled in the three years between January 1st, 1895, and January 1st, 1896.

115 EXHIBIT, "BETHEL No. 4."

Progress of The New York Telephone System under Message Rates.

	Number of Stations.		
	Flat Rate.	Message Rate.	Total.
January 1st, 1893	9993	.....	9993
January 1st, 1894	9911	.....	9911
June 1st, 1894, First Message Rate Schedule Adopted.	10063	2	10065
Nov. 1st, 1894, Second Message Rate Schedule Adopted.	8525	1729	10254
Jan. 1st, 1895	8038	2397	10435
June 1st, 1895, Third Message Rate Schedule Adopted	7323	4304	11627
Jan. 1st, 1896	6365	7004	13369
Jan. 1st, 1897	5855	10931	16786
July 1st, 1897, Fourth Message Rate Schedule Adopted	5391	13552	18943
Jan. 1st, 1898	5125	16410	21535
Jan. 1st, 1899	4628	22379	27007
April 20th, 1899, Fifth Message Rate Schedule Adopted	4410	25334	29754
June 1st, 1899	4209	26942	31241

116 EXHIBIT "BETHEL No. 5."

NEW YORK TELEPHONE COMPANY,
15 Dey Street, New York.

Synopsis of Direct Line Schedule for telephone service in the Borough of Manhattan, in effect April 20th, 1899:

No. of Local Messages to be sent in one year.	Annual Rate.	Additional Local Messages.
600	$75	8c.
700	81	8c.
800	87	8c.
900	93	8c.
1000	99	8c.
1100	105	8c.
1200	111	7c.
1500	126	7c.
1800	141	6c.
2100	153	6c.
2400	165	5c.
2700	174	5c.
3000	183	5c.
3300	192	5c.
3600	201	5c.
3900	210	5c.
4200	219	5c.
4500	228	5c.

Contracts will be taken, or renewed, at the above figures only, but in making adjustments, the entire schedule (which advances from 600 to 4500 by steps of 100) will be taken into consideration.

Additional information will be cheerfully furnished at either of the Contract Offices.

April 20th, 1899.

T. H. MACK, Contract Agent.

CONTRACT OFFICES:

18 Cortlandt Street, 15 Dey Street,
362 Broadway (23d Street), 113 West 38th Street.

EXHIBIT "BETHEL No. 6."

117 TELEPHONE STATISTICS, STOCKHOLM, AUGUST, 1898.

NUMBER OF SUBSCRIBERS.

The Allmanna and Bell Companies have about 13,700 subscribers in the City of Stockholm, and about 3,000 in the suburbs.

Between 9,000 and 10,000 lines are on a flat rate basis, and on these lines about 13 or 14 calls are made per day.

SCHEDULE OF RATES.

(All lines metallic circuit.)

Charge Per Year:

36 Kr. Message Rate Line (residence only), 400 messages per year, to be used 100 quarterly. Installation charge of 10 Kr.

45 Kr. Message Rate Line, 400 messages per year, to be used 100 quarterly charge of 10 Kr.

60 Kr. Flat Rate Party Line, arranged so that both subscribers can be called simultaneously, or either one call while the other is being called, but so that but one station can call at any time. Installation charge of 10 Kr. per year for five years.

80 Kr. Flat Rate Direct Line. Installation charge of 10 Kr. per year for five years.

100 Kr. Flat Rate Direct Line ("Star"). No charge to M. R. lines when calling a line of this grade. No extra charge for installation.

An additional charge of 10 Kr. is made for a desk-set—instead of regulation wall-set—under any contract other than that of 100 Kr. per year.

TOLLS.

No tolls are charged for calls to any points in the Company's territory (70 KM. rad.) except on calls to the Government system—for such a toll of
118 10 ore per message is made.

SUBURBAN RATES.

Message rate contracts in the suburban districts are made at a rate of 25 Kr. for service other than to or via the city of Stockholm, and the rate of 50 Kr. per year for service anywhere in the Company's territory is afforded.

119 EXHIBIT "SCLATER, No. 1."

The Bell Telephone Company of Canada.—1897.

The Directors beg to submit their eighteenth Annual Report.

Nine hundred and eighty-three subscribers have been added during the year, the total number of sets of instruments now earning rental being 30,445.

The Company now owns and operates 349 exchanges and 261 agencies.

Thirty-five miles of poles and 703 miles of wire have been added to the Long-Distance system in 1897; of these 5 pole miles and 200 wire miles are in the Ontario Department, and 30 pole miles and 494 wire miles are in the Eastern Department.

The long-distance lines now owned and operated by the Company comprise 16,567 miles of wire on 6,095 miles of poles.

Under authority of the shareholders, $66,500 bonds have been sold during the year, the premium thereon being 10 per cent.

Continuing the policy adopted in past years, your Directors have charged to Contingent Fund $150,000, that amount having been expended during the year on construction rendered necessary by the introduction of trolley and other strong current wires, but which has not increased the earning power of the plant.

All of which is respectfully submitted.

CHAS. F. SISE,
President.

ROBERT MACKAY,
Vice-President.

Montreal, February 24th, 1898.

120 REVENUE ACCOUNT, 31ST DECEMBER, 1897.

RECEIPTS.

Exchanges	$862,319.29
Long-distance lines	229,917.38
Private lines	12,619.01
Miscellaneous	80,828.93
	1,185,685.21

EXPENSES.

Operating	825,038.94	
Legal	7,725.51	
Insurance	23,733.68	
Bond interest	46,683.30	
Miscellaneous	3,752.21	
		905,933.64
Net revenue for 1897		279,751.57
Less dividends (inc. Jan. 15th, 1898)		253,440.00
Balance revenue from 1896		56,052.60
Carried forward to 1898		82,364.17

BALANCE SHEET, 31ST DECEMBER, 1897.

Stock account		$3,168,000.00
Bond account		940,000.00
Contingent fund	$950,000.00	
Less transferred to construction account	150,000.00	
		800,000.00
Revenue account		83,364.17
Unearned rental reserve		163,541.66
Insurance reserve		68,037.12
Accident reserve		15,574.06
121 Bond interest reserve		11,750.00
Sundry creditors		287,789.09
Bond premium		6,650.00
		5,543,706.10
Plant and patents, 31st December, 1896	4,202,567.79	
Purchase of patents, 1897	1,767.00	
Construction, 1897	$341,214.00	
Less contingent fund	150,000.00	
	191,214.00	
Plant and patents, 31st December, 1897	4,395,548.88	
Stores on hand	109,079.44	
Real estate	649,295.73	
Stocks in other companies	164,731.50	

Sundry debtors	40,897.87	
Due from agencies	74,858.91	
Cash	49,293.77	
		5,543,706.10

Audited and verified,
P. S. ROSS & SONS,
Chartered Accountants.

CHARLES P. SCLATER,
Secretary-Treasurer.

122 EXHIBIT "CRENSHAW IN REBUTTAL, No. 1."

Statement from the books in the Auditor's Office, D. C., showing deposits, etc., of the Chesapeake and Potomac Telephone Company, and the expenditures made therefrom, being the cost of repairs to cuts in pavements, in connection with the work of constructing their main and branch conduits, from June 1, 1891, to December 31, 1897.

		Deposits, &c.	Expenditures.
1891	Balance and deposits from June 1, 1891, to December 31, 1891	9,835 16	
	Expenditures		9,807 66
1892	Deposits from January 1, 1892, to December 31, 1892	20,301 63	
	Expenditures		18,033 11
1893	Deposits from January 1, 1893, to December 31, 1893	835 31	
	Expenditures		2,986 07
1894	Deposits from January 1, 1894, to December 31, 1894	689 83	
	Expenditures		1,021 58
1895	Deposits from January 1, 1895, to December 31, 1895	357 18	
	Expenditures		170 69
1896	Deposits from January 1, 1895, to December 31, 1896	593 63	
	Expenditures		607 13
1897	Deposits from January 1, 1897, to December 31, 1897	3,246 58	
	Expenditures		2,842 48
	Total Deposits and Expenditures	35,859 32	35,468 72
	Balance on deposit to credit of Company		390 60
		35,859 32	35,859 32

June 26, 1899,
Alonzo Tweedale,
Bkr. Auditor's Office, D. C.

123 EXHIBIT, "DELACY No. 1" in Re-buttal.

(Copy.)

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,

WASHINGTON, D. C., Jan. 5, 1898.

The Honorable the Secretary of the Interior.

Sir: I beg leave to invite your attention to the Departmental telephonic system. So far as this office is concerned, during the two years that have passed since its installation there has not been an entire day when it gave satisfactory service throughout the building. It has been a daily source of vexation, and has caused more inconvenience than the old method of sending messengers to convey communications. At times it seems to work fairly well, but there are occasions when in the midst of a conversation it will suddenly suspend.

Frequent complaints have gone from this office to the Department, and efforts have been made to correct the difficulties, but sometimes the repairer would scarcely depart before the same trouble, or worse, would be discovered.

Unless it can be made into a system that will perform proper service, I have the honor to request that it be entirely removed.

Very respectfully,

(Signed) CHAS. D. WALCOTT,
Director.

124 DEPARTMENT OF THE INTERIOR,

UNITED STATES GEOLOGICAL SURVEY,

September 28, 1898.

Dear Col. Rizer.

The telephone on the 5th floor of the Survey building is absolutely worthless. Much time is lost in trying to use it, and generally a messenger is sent from the telephone room with the message that our instrument cannot manage. Cannot something be done to improve or replace the thing.

Yours truly,

F. W. CLARK,
Chief Chemist.

(Endorsement.)

Sept. 28\98.

Respectfully forwarded to the Chief Clerk, Interior Dept. This complaint will apply with equal force to every Departmental telephone in the Survey building, and it has been repeatedly made ever since the inauguration of the system.

I again urge the installation of a practical system.

H. C. RIZER,
Chief Clerk.

125 *Stipulation of Counsel as to Certain Facts. Filed,* November 15, 1899.

On the 1st day of February, 1898, while the Act entitled "An act making appropriations to provide for the expenses of the government of the District of Columbia for the fiscal year ending June 30, 1899, and for other purposes was pending in the House of Representatives, it was amended by adding at the end of the paragraph headed 'Telegraph and Telephone Service' the following:

"Provided, That from and after the passage of this Act it shall be unlawful for any person or any telephone company doing business in the District of Columbia, to charge or receive more than fifty dollars per annum for the use of a telephone on a separate wire; forty dollars for each telephone, there being not more than two on a wire; thirty dollars for each telephone, there being not more than three on a wire, and twenty-five dollars for each telephone, there being four or more on the same wire." Said amendment was not reported from any Committee.

The bill in question passed the House of Representatives on the 2nd day of February 1898, no change having been made in the meantime in the proviso above quoted.

On the 3rd day of February, 1898, the bill was received by the Senate from the House of Representatives, and was by the Senate on the same day referred to the Committee on Appropriations of that body for consideration and report.

On the 2nd day of March, 1898, the Committee on Appropriations of the Senate reported said bill back to the Senate
126 recommending certain amendments, one of them being that said proviso should be struck out.

On the 8th day of March, 1898, the Senate refused to adopt said amendment, and reinstated said proviso in said bill.

On the 8th day of March, 1898, said bill, with said proviso as a part of it, passed the Senate, and on the 9th day of March, 1898, on account of differences between the Senate and the House as to other parts of the bill, it was sent to a Committee of Conference.

The bill finally became a law, and was approved by the President of the United States on the 30th day of June, 1898.

During the whole of the time said bill was so pending in Congress, it was a rule governing both the Senate and the House that a Conference Committee had no power to act upon any provision of a bill which had been agreed upon by both Houses; and it was a rule of the House of Representatives that in considering the report of a Conference Committee, no point of order could be made in regard to any provision which had been agreed to by both Houses.

Prior to the passage of said act, no investigation or inquiry was made by, or at the instance of, either House of Congress for the purpose of determining what would be fair and reasonable rates for telephone exchange services in the District of Columbia, except as follows:

On the 14th day of February, 1898, twelve days after the Bill containing said proviso had passed the House of Representatives, and been sent to the Senate, the House of Representatives adopted the following resolution:

"Resolved, that the aforesaid Committee (to investigate gas service in the District of Columbia) be authorized and
127 empowered to investigate the said charges as to the telephone service in the District of Columbia and all the facts connected therewith, to send for persons and papers, and particularly to procure such information, which, in their judgment, is necessary and proper, to determine what ought to be fair and sufficient rates for furnishing telephone service in the District of Columbia, and what ought to be fair and reasonable use of telephones by the persons and corporations renting telephones, and those associated with them, in business or otherwise, and report their conclusions to the House at its present session.

"Resolved, that the expenses attending such investigation, such as shall be necessary, be paid out of the contingent fund of the House."

On the 9th day of March, 1898, the Committee of the House appointed by the foregoing resolution, to investigate the charges for Gas and Telephone service in the District of Columbia, met, and began the investigation. That Committee continued taking testimony, from time to time, in relation to the telephone service in the District of Columbia until June 13th, 1898, when it had its last meeting. On the 8th day of July, 1898, the Chairman of the Committee, Mr. Grout, on behalf of the Committee, submitted to the House of Representatives the following report:

"The committee to investigate the gas and telephone service in the District of Columbia, appointed under the resolution adopted by the House of Representatives, February 14, 1898, submit herewith, for the information of the House, the testimony heretofore taken by it relating to the charges for telephones in the District of Columbia.

128 The Committee has not had opportunity, within the limited time at its disposal, to take up the questions relating to gas.

The committee submits this report at this time in order "that "the testimony taken may be printed for the information of the "House, and submits the request that the Committee, inasmuch "as it has been unable to complete its work, be continued with "its full powers under the said resolution, with leave to sit in "vacation, and to report at the last session of the present Con"gress."

Later, on the same day, the House of Representatives adjourned sine die, without taking any action upon the foregoing recommendation of the Committee.

On the 28th day of February, 1898, the Senate adopted the following resolution:

"Resolved, that the Committee on the District of Columbia be authorized and empowered to investigate as to telephone service in the District of Columbia and all facts connected therewith, and be authorized to send for persons and papers, and particularly to procure such information which in their judgment is necessary and proper to determine what ought to be fair and sufficient rates for furnishing telephone service in the District of Columbia, and what ought to be fair and reasonable use of telephones by the persons and corporations renting telephones, and those associated with them in business or otherwise, and report their conclusions to the Senate as early as practicable."

On the 2nd day of March, 1898, the Senate adopted the following resolution:

"Resolved, that in the investigation, ordered by the Senate, into the cost of telephone service in the District of Co-
129 lumbia, the Committee on the District of Columbia, or any sub-committee of that Committee, is authorized to sit during the sessions of the Senate, and the necessary expenses of the Committee, including expert accountant and stenographic work, shall be paid out of the contingent funds of the Senate on the certificate of the Chairman of the said Committee."

Immediately thereafter the Committee on the District of Columbia of the Senate, by a sub-committee thereof duly appointed for the purpose, prepared to enter upon an investigation in accordance with said last mentioned resolution, and began by requesting Mr. Charles W. Haskins, an expert accountant, to examine the books of The Chesapeake and Potomac Telephone Company. In pursuance of said authority, said Haskins immediately thereafter began such examination. Afterward, on the 8th day of March, 1898, after the Senate had, as aforesaid, reinstated said proviso in said bill, the Committee on the District of Columbia of the Senate was discharged from the further consideration of the matters be referred to it by said last mentioned resolution upon the motion of Senator McMillan, the Chairman of said Committee, and for the reason thus stated by Senator McMillan to the Senate at the time.

"The Senate having disposed of the question in regard to telephone charges, it is manifestly not necessary for the subcommittee on the District of Columbia to go on with their work. Therefore I move that that committee be discharged from the investigation of the subject which they have commenced."

130 It is agreed that the foregoing is a true statement of the facts to which it relates, and that it may be used in evidence in this case.

J. M. WILSON,
A. S. WORTHINGTON,
Solicitors for Defendant.
A. A. BIRNEY,
J. J. HEMPHILL,
22 Nov. 1898. *Solicitors for Complainant.*

131 *Order Consolidating Certain Causes. Filed,* February 5, 1900.

In the Supreme Court of the District of Columbia.

JAMES F. MANNING *et al.*,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.
} In Equity. No. 19,558.

Upon motion of the Solicitors for the defendant in this case and in the cases hereinbelow referred to, and by consent of counsel for the respective parties in all said cases hereto subjoined, it is, this 5th day of February, 1900, Ordered that the above entitled case and the cases referred to in the list appended to the order of consolidation made in this case on the seventeenth day of November, 1898, and the cases enumerated in the list hereto appended shall be and they are hereby submitted for final hearing upon the depositions taken and the evidence introduced in the above entitled case, which depositions and evidence shall be deemed to have been taken and filed in each case mentioned in the list hereto appended, saving to the parties all just exceptions.

JOB BARNARD,
Justice.

Solicitors for all the Complainants.
J. M. WILSON,
A. S. WORTHINGTON.
Solicitors for Defendant in all the cases.
BIRNEY & WOODARD, *as for Complainants.*
HEMPHILL & PETER, *Attorneys for Complainants.*

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No.	19,804	C. C. Bryan,
"	20,086	Albert E. Beitzell,
"	20,171	James T. Clements,
"	20,185	Geo. W. Cochran,
"	20,488	Childs & Company
"	19,952	J. E. Dyer & Company

	"	20,179	Equitable Life Assurance Society,
	"	20,195	Emrich & Company
	"	19,973	First Co-operative Building Association,
	"	20,443	Adolph Gude,
	"	20,454	Fannie Greenapple,
	"	20,348	Frank E. Hopkins
	"	20,184	V. Baldwin Johnson
	"	20,446	Esau L. Johnson
	"	19,965	Kelly & Chamberlin
	"	20,349	J. Louis Loose,
	"	20,350	Latimer & Nesbit
	"	20,492	John Miller & Company
	"	20,510	Geo. F. Muth & Company
	"	19,950	Ada S. Reid
	"	20,347	John C. Rau,
	"	19,953	E. T. Simpson
	"	20,444	Stumph Bedding Company
	"	19,934	James Tharp
	"	19,959	W. H. Tenney & Sons
	"	19,966	Tyssowski Bros.
	"	19,999	Anson S. Taylor
	"	19,971	Wash. Title Insurance Company
	"	20,018	Wash. Grain Exchange
	"	20,177	J. G. Waters & Son
133	"	20,207	Wash. B. Williams
	"	20,208	D. Webster Prentiss
	"	20,649	Geo. H. LaFetra
	"	20,650	Christian Xander
	"	20,668	P. S. Warren & Company,
	"	20,763	B. F. Saul
	"	20,764	John T. Varnell & Company
	"	20,767	Thomas T. Keane
	"	20,786	Lappin & Davis
	"	20,830	Geo. W. Cochran, (Cochran Hotel),
	"	20,831	Prindle & Russell,
	"	20,832	O. O. Spicer
	"	20,853	Clarendon Smith
	"	20,860	John Kennedy
	"	20,859	Wm. B. King
	"	20,869	American Bonding & Trust Company
	"	20,879	John Miller & Company.

134 *Opinion of Justice Barnard. Filed*, February 5, 1900.

In the Supreme Court of the District of Columbia.

JAMES F. MANNING, *et al.*,
vs.
THE CHESAPEAKE & POTOMAC TELEPHONE COMPANY.
} In Equity. No. 19,558.

In the Act of Congress approved June 30, 1898, entitled "An Act making Appropriations to provide for the Expenses of the District of Columbia, for the fiscal year ending June 30, 1899, and for other purposes," is a clause relating to and making appropriation for "Telegraph and Telephone Service." Immediately following the enumeration of the several specific objects for which moneys are appropriated in this section of the Act, is the following provision: "*Provided*, That after the passage of this Act, it shall be unlawful for any person or any telephone company doing business in the District of Columbia to charge or receive more than fifty dollars per annum for the use of a telephone on a separate wire, forty dollars for each telephone, there being not more than two on a wire, thirty dollars for each telephone, there being not more than three on a wire, and twenty-five dollars for each telephone, there being four or more on the same wire." (30 Statutes at Large, 537, 538.)

135 The defendant was the only telephone company doing business in this District on that date. It was organized under the incorporation laws of the State of New York, and has been in business here, and in Maryland, and part of West Virginia, since the year 1883.

It is averred in the third paragraph of the bill that "the defendant has, with the assent and under the direction of the Congress of the United States and of the Commissioners of the District of Columbia, laid and yet maintains in the public streets, avenues, and alleys of the City of Washington, many miles of conduit for the carrying of electric wires, and has strung many other electric wires over and across other public avenues, streets and alleys in said City, and yet maintains the same" &c.; that it maintains a central office or telephone exchange; and that it "is a common carrier of telephone messages, and is bound in law to furnish, set up and maintain telephones in the premises of all persons in the said City of Washington who may request the same and pay the lawful charges therefor (such premises being upon or near to the lines of service wire established by said Company), and to furnish such persons, their families, servants, agents and employes, connection through said telephone exchange with other telephones, and to suffer and permit them to send and receive messages over said lines of wire."

It appears that complainants had a contract with the defendant at the time the said Act was passed, by which it was agreed that said defendant should furnish the complainants with a telephone at their office, at the corner of 14th and H streets, in Washington City, the same being of the type known as the complete special metallic circuit, for which the sum of $145 per year was to be paid, with a discount of $2.50 per quarter,
136 for prompt payment, quarterly, in advance. Two days after the passage of this Act, complainants notified the defendant that they desired to terminate their said contract at the expiration of ten days, as they had a right to do under its terms. The defendant acknowledged receiving said notice on the 4th of July, and, in reply, stated that it would remove the telephone and send bill as requested on the 14th of July. On the 12th of July, however, complainants again wrote the defendant, stating that they would retain the telephone in their office at the rate fixed by the said Act, after termination of their said contract, and made a tender of the amount for one quarter, in advance. This tender being declined by the defendant, the complainants thereupon filed their bill in this cause on July 14th, to enjoin the defendant from removing the telephone from their office, and from disconnecting them from the exchange. The defendant answered the bill, and after hearing had on bill, answer and affidavits, on a rule to show cause why the defendant should not be enjoined as prayed, *pendente lite*, an injunction was granted, the complainants being required to give the usual bond, and, in the meantime, to pay the rate of $50 per year for the use of said telephone and service. The parties thereafter proceeded to take a large mass of testimony, and the cause now comes on for final hearing on pleadings and evidence.

Some of the questions suggested by the record and briefs of counsel are, What are the equities, if any, as established in the case, which warrant the Court in granting an injunction as prayed, under the general principles of equity jurisprudence?

Is said Act unconstitutional by reason of its provisions
137 being repugnant to those sections which provide that no person shall be deprived of life, liberty or property without due process of law, and private property shall not be taken for public use without just compensation, and no state shall pass a law impairing the obligation of contracts.

The Act does not require in words any specific quality of character of instruments, equipment or service, but the kind of equipment which the complainants seek to enjoin the defendant from removing, is one of the best and most expensive known to be in existence at the present time. It is the long-distance solid back telephone, and connected with the exchange by a metallic

circuit; that is, by two copper wires that cross each other at certain intervals. There is a much cheaper and more inferior equipment in use by some subscribers, called the Blake transmitter, with a grounded circuit; that is, a single wire of iron or steel, running from the central office to the subscriber's station, and thence to the ground, that being made to take the place of a return wire. In cities where electrical currents are used for lighting and propulsion of street cars, this grounded circuit, it is claimed, is very unsatisfactory, and a confusion of sounds in the telephone is liable to result; so that the metallic circuit is preferred, but the cost is much greater.

The service rendered by the defendant for the complainants, it appears by the proofs, is also as good as such service can be made in the present state of the art. The complainants have their own special wire running from their office to the central office of the defendant, through which there can directly converse with any other subscriber in the District. In other
138 words, there is but one switchboard, and that is so arranged that a single person answers the calls of each subscriber, and connects the telephone of the caller directly with the telephone of the person called. The subscribers are placed in groups, a single operator having one hundred telephones to answer, and the switchboard is so arranged that the other nineteen hundred subscribers, in case there are two thousand in the exchange, are within the reach of each operator. It is quite evident that the best service is obtained through a single central office, or one switchboard, rather than through a divided board, or sub-station, as these require communication with more than one person, and in such case delays and mistakes are more liable to occur.

Another advantage which the complainants have by their superior equipment is, that they can be at once connected with the long-distance lines maintained by the American Telephone and Telegraph Company throughout the country, and can then talk in their own office directly with persons in the distant cities. When used for this purpose, however, an extra charge is made on what is known as the toll system, the amount depending on the distance, and length of time consumed in talking. The defendant states in its answer that the expense of maintaining this class of equipment and service will exceed the maximum rates named in the said Act. If this claim is true, whether the said Act of Congress is valid or not, would it be equitable to enjoin the defendant from discontinuing business for that reason, without allowing it to substitute a cheaper grade of service and equipment? Can the Court, by its injunctive process, compel a party to continue to carry on a business at a loss, or against his will, because he believes it to be

139 at a losing rate? The bill avers that notice was duly given terminating the contract of the complainants. The ten days expired on July 14th, 1898. After giving this notice, and two days before the telephone was to be removed, the complainants informed the defendant that they would be willing to retain the telephone and connection at the rate of $50 a year; but this willingness to do so did not operate to make a new contract, or to annul their notice, terminating the only one then existing. Their second letter states: "We hereby notify you that after our present contract with you shall have expired, pursuant to our notice sent you, we will retain the telephone on our premises, &c., at the rate fixed by the recent Act," thus showing that their claim is based wholly on the supposed rights growing out of the statute, and resulting from the character of the business conducted by the defendant, as a quasi-public corporation; and that they had no contract relations whatever with the defendant when the bill was filed.

This Act does not refer to the defendant company by name; and counsel for complainants frequently insisted during the argument that it was not intended for the defendant especially, suggesting that if the defendant could not render the service required at the rates fixed, it should quit, and let some one else have a chance to do so. But this argument does not agree with the scheme of the bill. The prayer of the bill is that the temporary injunction may be made perpetual so long as complainants shall continue to pay to the defendants, quarterly in advance, for such telephone and telephone exchange serv-

140 ice, at the rate of $50 per annum. The temporary injunction passed herein, and now in force, restrains and enjoins the defendant from removing or attempting to remove from the premises of the complainants the telephone and its appliances by said defendant heretofore placed therein, and from refusing or neglecting to connect the same with other telephones upon being requested so to do, and from neglecting or refusing to furnish telephone exchange service to the complainants for the said telephone in the same manner as it has heretofore furnished such service. So that the claim appears to be that no matter what may be the cost of furnishing the identical equipment and service heretofore furnished, and for which the complainants had formerly contracted to pay $145 per year, (or $135 with discount off), and which contract either party had the right to terminate on ten days' notice. The defendant must, willy-nilly, continue to furnish the same class of material and labor, in the same first class and expensive manner, at the will of the complainants, forever, because this Act makes it unlawful to charge more than $50 per year for a telephone on one wire; this, too, regardless of the increase or decrease in the cost

of labor, or material, or other changes in conditions, or improvements in instruments, new patents or better methods.

The Court is asked to make, in effect, a decree to operate as a contract binding on the defendant perpetually, but with no obligation on the part of the complainants to continue for any definite length of time, or to do any other thing except to pay $50 a year. To do this would require the Court to construe this law as if it granted a perpetual monopoly to the defendant, and affirmatively and expressly required it to do all the tele-
141 phone business in this District at the rates stated and to furnish the best grade of service and equipment then being furnished by the defendant, and to continue to furnish the same indefinitely, so long as parties are willing to pay therefor at said rates.

Granting that Congress had the power to pass this law, and that the defendant is a public service corporation, and a common carrier of telephone messages, and bound to furnish the high grade service and equipment as claimed, is it the province of a court of equity to compel it to continue to do business, with or without a profit, against its will? If it should refuse to perform a duty for the public, or for a citizen, which it was required under its charter, or from the nature of its business, to perform, would not the proper remedy be mandamus?

C. & P. Tel. Co. vs. B. & O. Tel. Co. 66th Maryland, 399,
State vs. Nebraska Tel. Co., 17 Neb., 126.
Hangen, vs. Albina &c., Co., 21 Oregon, 411.
State, ex rel. &c., vs. Bell Tel. Co., 36 Ohio St. 296.
Central Union Tel. Co. vs. Bradbury, 106 Ind. 1.
Same vs. State, ex rel, Falley, 118 Ind. 194.
Union Pacific R. R. Co. vs. U. S., 59 Fed. Rep. 813.

An injunction is a remedy to prevent the doing of some alleged wrong, not to require the doing of a lawful act. A mandatory injunction is a proper remedy to require the undoing of something which it was inequitable for the defendant to have done; but the effect of the injunction asked in this case is to compel the defendant to go on doing as it did under its previous contract. It is enjoined also from removing its property
142 from the premises of complainants, but that is only a trifling matter, and the telephone might be left there with slight loss to the defendant. But the principal effect of the injunction is to prevent it from stopping or from doing nothing, and to require it to keep going on indefinitely furnishing service and supplies.

Would not an action for damages be a complete and adequate remedy on behalf of a party who might be wrongfully refused the use of a telephone? The Court obtains no additional power in this direction by virtue of the Act in question. It imposes

no new duty or power on the defendant, but only deprives it of its power to charge beyond the maximum rates to be thereafter received.—The bill does not state a case, and the evidence fails to show a case, where irreparable injury would be done the complainants by permitting the defendant to remove its telephone from the complainant's office. The averment is, that "Their business will be greatly interrupted and injured, and they will be put to loss, annoyance and embarrassment, for which they will have no adequate remedy at law." There is no averment that the defendant is insolvent, or that the injuries to be sustained by the complainants would be irreparable. The complainants could still conduct their business, which is that of dealers in marble, as they were obliged to do only a few years ago, by mail, messenger, telegraph, personal interview, or otherwise. This might be less convenient and more expensive, but if damage was sustained by the wrongful refusal of the defendant to connect them with the exchange, could it not be ascertained and recovered in an action at law? These are
143 questions which indicate grounds for refusing the injunction and dismissing the bill, it seems to me, based on the want of jurisdiction, and absence of equities.

But, as the case is a novel one, and raises important constitutional questions, some inquiry as to these should be made before disposing of the case.

While Congress is given power "to exercise exclusive legislation in all cases whatsoever" over this District, that should not be understood to mean that it can exercise powers which are prohibited to the States, in respect of personal rights guaranteed by the Constitution. What can Congress do by way of legislation affecting the property rights of the citizen more than a state can do? The exclusive legislation it is authorized to exercise over this District means only legislation exclusive of any state. That is, no state shall have any right or power whatever to legislate for the territory constituting the seat of the National Government. Persons residing and doing business here, however, are just as safely protected in their rights of trial by jury, their freedom of speech, their rights of petition, their right to be secure in their persons, houses, papers and effects against unreasonable searches and seizures, the right to be not deprived of life, liberty, or property without due process of law, and the right to have private property not taken for public use without just compensation, as are the citizens of the States. This protection is guaranteed by the first ten Amendments to the Constitution, which are limitations upon the power of Congress, and not upon the power of the States.

144 While Section 10 of the first article of the Constitution expressly provides that no state shall pass any law im-

pairing the obligation of contracts, it is not to be inferred or presumed from that language that Congress can do so. There is no express power given it to do so, and none can be implied except in a case where it is given express power to legislate upon a certain subject, in which case this power to legislate cannot be defeated by the fact that it must incidentally or necessarily impair the obligation of contracts. Some of such cases are those relating to bankrupts, regulating the value of money, declaring war, &c. By the 10th Amendment, the powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively or to the people. While Congress has exclusive legislative power over this District, in the sense above stated, it is not authorized to take A's lot for a public building, without just compensation, or B's horse from his stable and give it to C, or to deprive D of his contract of lease by requiring him to cancel the same, and surrender it to E, without consideration.—If, however, by any construction it can be said that Congress is not prohibited by the express provisions of the 10th Section of Article 1 from passing any law impairing the obligation of contracts, still it is contended that the language of the Fifth Amendment necessarily prohibits such legislation, for contracts are property, within the meaning of that provision, which cannot be taken without due process of law. The property of some persons may be wholly invested in contracts with other persons, and will it be contended that Congress can arbitrarily take this
145 property right, or contract-investment, away without compensation? Can it, in the exercise of exclusive legislation here, impair a private contract, not interfering with the power to legislate on a certain subject, any more than a state legislature can do so in a state? In my opinion, this question can only be answered in the negative.

Such being the proper construction, is the law now under consideration repugnant to such provision? On June 30, 1898, the defendant, a corporation, but still a "person," within the meaning of that word as used in the Constitution as decided many times by the Supreme Court (Smyth vs. Ames, 169 U. S., 522)—had numerous contracts in force with private persons, and with the District, and General Government, on the faith of which it was justified in making expenditures and incurring obligations. These contracts were based on good and valuable consideration, not against public policy, and were in every sense legal. They had been voluntarily made, were in writing, and were duly signed. They had some time to run before they could be terminated by either of the parties thereto. If said Act of Congress could be construed in no other way than as relating to, and intended to be operative upon, said contracts, so as to relieve the contracting parties from their obligations

thereunder, I should have to hold that it was beyond the legislative power. But I do not think it is necessary to so construe it, or that it was so intended. At any rate, it should be construed in such way as to render it unobjectionable on that ground, if such construction be possible. The words are, "that from and after the passage of this Act it shall be unlaw-
146 ful for any person or any telephone company doing business in the District of Columbia to *charge or receive* more than fifty dollars," &c. The words "to charge" would seem to imply some act to be thereafter done by the person or telephone company, some contract to be thereafter made in which charges were to be fixed; and if that is true, then it would not necessarily apply to any lawful existing contract in which the charges were already made before the passage of the law. These words "or receive," would, at first glance, seem intended to apply to the money to be received under the then existing contracts, as well as that to be received under those thereafter to be made; but, on closer inspection, however, it may be seen that they can be read as if they were intended to follow the charges to be thereafter made, and, perhaps, ought to be read as if the words were, "It shall be unlawful hereafter to charge and receive more than fifty dollars" &c., thus converting the disjunctive, "*or*," into the conjunctive, "*and*." With this construction which I think may be the proper one, the law would not *prima facie* be repugnant to the provisions of the Constitution which prohibits the impairment of contracts. The complainants must have understood the statute, as so construed, for the reason that they terminated their contract then in force before asking for the benefit of the lower rates named therein, and before filing their bill for injunction.

There are, however, a number of cases consolidated with this, by order passed herein on November 17th, 1898, and in several of these bills were filed for injunction while the contract between the parties was still in force by its terms; and as to all such cases it is my opinion that the said statute, although
147 valid, would not apply, and that the parties to said contracts would continue to be bound by them until they were properly terminated.

This view dispenses with the necessity of any further opinion as to the effect of this Act on existing contracts between the defendant and the various departments of the Government. Such contracts, it must be held, were not intended to be affected; and by this construction, Congress is relieved from the criticism of intending to so legislate as to change the terms of contracts to which the Government was a party, without the consent of the other contracting party.

I now take up the point to which most of the proof and argument has been directed, namely, the claim of the unconstitu-

tionality of the Act on the ground that the rates fixed are too low to allow any return or reward to the defendant for the moneys invested in the business, and necessary to be used to supply the service. It is conceded in argument that the defendant is a public-service corporation, although it has no power to condemn property for its purposes. A corporation of this class usually has, by express grant, or under the circumstances of the case, a monopoly of the business to be done. If a railroad company, and having the right to lay tracks on a street and run cars thereon for carrying passengers, it naturally expects to have the right of carrying all who wish to ride on that street; and as such right is valuable, such corporation accepts the terms prescribed as to the rates to be charged. If the rates are fixed in the charter, as is usually done, that becomes a part of the contract, and the right to exist is the consideration for the surrender of its right to contract about rates of compensation for its work.

148 And when a charter is granted by one state, and the corporation formed thereunder goes to another state or district to do business, the state or district where the work is to be done may prescribe reasonable regulations as terms on which it can be admitted to operate. In the case of the defendant company it does not appear that any formal terms were ever prescribed by Congress, upon compliance with which it was authorized to do business here. It came here, however, and began business in 1883, getting the permission of the District Commissioners to string wires and to lay conduits, and making its contracts with the citizens, and with the various departments of the Government, to furnish them with telephones and telephone service; and Congress acknowledged its right to be here by making appropriation from time to time to pay it for telephones used by the Government under its various contracts, and in other ways.

(26 Stats. at Large, 518.

30 Stats. at Large, 117, 126.)

The first effort to establish a telephone exchange in this city was made in 1878, when George C. Maynard began by running a line from the Capitol to his office, and from his office to the office of the Evening Star Newspaper Company. In January 1879, a partnership was formed by him with another gentleman, under the name of the National Telephone Exchange, and in December of the same year, the firm sold out its interests to a corporation known by the name of the National Capitol Telephone Company, which continued the business until August 1883, when it sold out to the defendant Company, which has been the only person or telephone company doing a gen-

149 eral telephone business in this District from that time to the present.

The capital stock of the defendant for its whole territory was fixed at $2,6500,000, of which $750,000 was allotted to this District, and represented the plant and assets of the said National Capital Telephone Company, including its good will, and all its patent-right and other contracts. The general expenses of the defendant company have been equitably apportioned between the District and the territory outside; and in the course of its business it became necessary for it to issue bonds to the amount of $500,000; and the payment of these was apportioned in like manner, two-fifths being chargeable to that part of defendant's business which is within this District.

The first inquiry under this branch of the case is to ascertain what relation, if any, exists between the Act and the defendant company, or whether the purpose of the Act is necessarily to regulate the charges of the defendant company. The Act, by its terms, is to take effect immediately after its passage, and the defendant is the only person or company to whom it could then be applicable. If it could be construed as intended only for the government of any person or company thereafter to commence doing business in the District, no question would be likely to arise in the courts in respect of the reasonableness of the charges to be allowed, for such person or company would investigate the prospective profits and expenses before investing in the enterprise or assuming the responsibility of "common carriers of telephone messages." In this case, however, the investment was made and the defendant had incurred cer-
150 tain contract liabilities which it could not repudiate, and had constructed an expensive plant, before any rates were fixed or any intimation had that the rates were to be regulated in any way except by agreement.

Mr. Justice Harlan, in pronouncing the opinion of the Supreme Court in Smyth vs. Ames, 171, U. S., 364, speaking of the time when the facts exist which are properly to be considered in forming a judgment as to rates, uses the following language: "The reasonableness of a schedule of rates must be determined by the facts as they exist when it is sought to put such rates into operation."

It would seem from this principle that said Act was intended to regulate the price to be received by the defendant for the service it was then furnishing; and as the rates were to be put in force immediately, and to be applicable to all contracts thereafter made, the condition of the defendant's property and business at and about that time, to wit, June 30, 1898, must be considered in reaching any conclusion as to whether the rates fixed are just and fair to the defendant and to the public.

Before the entering upon the consideration of those facts, it may be well to state what appears in a stipulation of counsel, filed in this cause, as to how the provision in question came to

be passed. The said appropriation bill was pending in the House of Representatives on February 1st, 1898, when the provision in question was added as an amendment, and the bill as thus amended passed the House the next day, February 2nd.

On February 3rd, the bill went to the Senate, and was re-
151 ferred to the Committee on Appropriations for consideration and report. On March 2nd, it was reported back to the Senate by that Committee, who recommended certain amendments, one of them being that said proviso should be struck out. On March 8th the Senate refused to adopt said amendment, and the said provision was thereupon reinstated, and the bill passed, with certain amendments in other respects. On March 3rd, it was sent to a Committee of Conference, and finally became a law on June 30, 1898. While pending in conference, it was a rule in both Houses of Congress that a Conference Committee had no power to act upon a provision agreed upon by both Houses; and it was the rule of the House of Representatives that in considering the report of the Conference Committee, no point of order could be made in regard to any provision agreed to by both Houses.

On February 14th, 1898, twelve days after the bill had passed the House of Representatives, that body authorized one of its Committees to investigate the charges as to telephone service in this District, to determine what ought to be fair and sufficient rates for furnishing said service, and what ought to be fair and reasonable use of telephones by persons and corporations renting them, and those associated with them in business or otherwise, and to report its conclusions at that session. On March 9th, the Committee met and continued to take testimony from time to time until June 13th, when it had its last meeting. On July 8th it reported the testimony taken, that it might be printed for the information of the House, and asked that the Committee be continued, with leave to sit in vacation, inasmuch as

it had been unable to complete its work (other matters
152 being also referred to it). The House adjourned, however, on July 8th, without taking action on this request.

On February 28th, 1898, the Senate authorized its Committee on the District of Columbia to investigate as to telephone service in the District, substantially as the House Committee had been authorized to do, and to report its conclusions as early as practicable. On March 2nd, this Committee was authorized to sit during the sessions of the Senate. By a sub-committee thereof, it began preparation for such investigation by requesting Mr. Charles W. Haskins, an expert accountant, (who is one of the witnesses examined in this case,) to examine the books of the defendant corporation, which he started to do, but before he could make such examination, the Senate had passed the said provision, and on the same day it passed, March 8th, on

motion of the Chairman, the said Committee was discharged from the further investigation of the subject.

By reason of these admitted facts, the Act is characterized by counsel as being hasty and ill-considered legislation, tacked on to an appropriation bill while under consideration in the House, and passed in both Houses without the benefit of any recommendation and report from any Committee, and against the advice of the Senate Committee, the only one giving the subject any investigation prior to its passage. It is also claimed that the legislation should not have been enacted without first hearing the defendant company as to the facts pertaining to its said business, for otherwise, it would seem to be unfair and arbitrary. It is also objected to because it selects only one
153 reason among many why there should be different maximum rates for telephone service at any given place, namely, the fact of one or more telephones on the same wire. Among many other reasons than the one stated, which would seem to suggest a difference in prices for telephones, are these, namely; the comparative distance from the central office or trunk lines; the style and finish of instruments and equipments; the kind of circuit used, grounded or metallic; the kind of wire, steel, iron or copper; the comparative number of calls sent and received; the place where the telephone is located, in business houses or residences; the quality and efficiency of the service rendered, whether by means of one multiple switchboard or a divided switch-board, a single central office or several sub-stations, by over-head wires or underground wires; and the time in which the service is rendered, whether all day and all night, or only during certain hours in the day or night.

While exact justice would require that the individual should only pay for what he receives, and that the party furnishing service should receive only fair and just compensation for what he furnishes, and that neither should give something for nothing, still there are cases where a lump sum charged for unlimited service for a given time may be substantially just, and amount to proper compensation; and so I should hold that none of these objections to this law is sufficient to warrant the Court in holding it invalid. The form given it, its place on the appropriation bill, its passage with or without previous investigation and recommendation of committees, its single reason
154 and basis for determining different maximum rates, are all matters for the judgment and discretion of the legislative body, and will not render the Act void as being repugnant to the Constitution. They are matters of form rather than of substance; and, notwithstanding they may be legislative imperfections, they will not render the Act invalid. If the

result, however, is that the rates so fixed are so unreasonably low as to prevent the Company conducting the business from receiving such compensation as, under all the circumstances, will be just to it and to the public, the Act will be unconstitutional under the Fifth and Fourteenth Amendments.

The controlling question in the case, then, is this: does this Act prescribe rates which will enable the defendant to receive a reasonable reward for the skill, labor and property required of it in the proper conduct of its said business?

The courts have decided what classes of facts and circumstances are properly to be considered in determining questions of this character, and some of these will be here stated. In Smyth vs. Ames, 169 U. S., 546, the Supreme Court, speaking of the rates fixed by a Commission appointed under an Act of the Legislature of Nebraska to regulate the charges to be made by railroad companies, used this language:

"We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a highway under legislative sanction, must be the fair value of the property being used by it for the convenience of the public, and, in order to ascertain that value, the
155 original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses, are all matters for consideration, and are to be given such weight as may be just and right in each case."

The same Court had previously said, in speaking of a turnpike Company:

"Each case must depend upon its special facts, and when a Court, without assuming itself to prescribe rates, is required to determine whether the rates prescribed by the Legislature for a corporation controlling a public highway are, as an entirety, so unjust as to destroy the value of its property for all the purposes for which it was acquired, its duty is to take into consideration the interests both of the public and of the owner of the property, together with all other circumstances that are fairly to be considered in determining whether the Legislature has, under the guise of regulating rates, exceeded its Constitutional authority, and practically deprived the owner of property without due process of law." (Covington and Lexington Turnpike Road Company vs. Sanford, 164 U. S., 596.)

In the latest reported case in which this subject has been considered by the Supreme Court (San Diego Land Company vs. National City, 174, U. S., 757), the following contention of appellant is approved:

"The Court should take into consideration the cost of its plant, the cost per annum of operating the plant, including interest paid on money borrowed and reasonably necessary to be used in constructing the same, the annual depreciation of the plant from natural causes resulting from its use, and a fair profit to the Company over and above such charges for its services in supplying the water to consumers, either by way of interest on the money it had expended for the public use, or upon some other fair and equitable basis."

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The Court then adds, that "real value of the property, and the fair value in themselves of the services rendered," should also be taken into consideration.

It appears by this case that the Statute of California required the rates in question to be fixed annually, thus recognizing that what might be reasonable prices for one year might be unreasonable for the next year. The wisdom of such a limitation is evident, and it would have been well in the law now under consideration to have had some time and machinery for changing the rates, for it is contended that since June 30th, 1898, there has been a decided increase in the cost of copper wire and other materials used by the defendant in maintaining its plant and business.

Authorities have been cited which state in substance that such a question as this is always an embarrassing one to a judicial tribunal, because it is primarily for the determination of the legislature or of some public agency designated by it. When it is alleged, however, that a statute invades or destroys rights secured by the Constitution, a judicial question arises, and the courts must answer it as they would any other such question, taking care, however, not to intrench upon the authority of the law-making power, nor to disregard the statute under consideration, unless it be unmistakably repugnant to the fundamental law. As stated in Pine Grove vs. Talcott, 19 Wallace, 666 "The opposition between the Constitution and the law should be such that the judge feels a clear and strong conviction of their incompatibility with each other." If clearly so repugnant, however, the failure of the Court to so find and decree, would not be excusable on grounds of delicacy or judicial timidity.

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The maximum rates fixed by this Act, if they had been put in operation on July 1st, 1898, and made applicable to all the different telephones then operated by the defendant in this District, would have produced an income in round figures at a rate of a little less than $100,000 per year. The average number of telephones in use for the nine months ending September 30th, 1898, was 2126, some one on a wire, and some two or more on the same wire; and the different rates for these would make the

average rate about $47 per telephone. The evidence of Mr. Haskins shows, beyond question, that the income realized by the defendant from its previous rates, as per contracts, was, in round figures, at the rate of a little less than $200,000 per year, and that for the six years prior to said date, the total gross earning of the defendant had been as follows:

For 1892, $178,689.38.
For 1893, $194,257.94.
For 1894, $192,289.60.
For 1895, $194,119.57.
158 For 1896, $194,070.32.
For 1897, $206,417.64.

That the total expenses during the same period had been as follows:

For 1892, $106,121.33.
For 1893, $119,167.86.
For 1894, $129,045.89.
For 1895, $108,102.75.
For 1896, $121,794.34.
For 1897, $186,276.79.

About the same average of earnings as in 1897 was kept up for the first nine months of 1898. The average expense per telephone during this time was at the rate of $71.20, per year. During these six years the dividends paid on the stock allotted to this District, ($750,000) were as follows:

For 1892, two per cent, $15,000.
For 1893, 2½ per cent, $18,750.
For 1894, 2 per cent, $15,000.
For 1895, 2 per cent, $15,000.
For 1896, 3 per cent, $22,500.
For 1897, 4 per cent, $30,000.

The average rate of earnings per subscriber during these six years was, in round figures, about $100; so that it appears that the income derived from the contracts of the defendant with its subscribers was at least 100 per cent. greater than the income which would be derived from the rates fixed by the statute, reckoning on the basis of an equal number of subscribers of the same classes.

159 It is claimed by counsel for complainants, that a much larger number of subscribers would at once be procured if the defendant should observe the statute rates, and that correspondingly greater profits would follow. While it is quite probable that an increase of subscribers might be the result of the lower rates, yet it is by no means certain that such would be the case. It is likely that most of the business houses and offices and officials of the Government in this District, and many of the more prosperous residents, have the telephone

now; and the population is so largely composed of people employed in the Departments, and officially connected with the Government, who would not generally have telephones at their residences, that the increase of subscribers cannot be relied upon to such an extent as it might be in other cities. If a considerably larger number of subscribers should, however, result, the average expense per subscriber would not in my judgment be reduced. The cost of construction in the central office, and the cost of operating, would be increased for such additional per subscriber, as switchboards are now constructed, while the general expenses and salaries might be reduced per subscriber.

The safer guide for the future, is the history and experience of the past. In the case of Smyth vs. Ames, 169 U. S., the experience of the railroad companies for the past three years was made the basis of calculation for the probable effect of the statute, and the Court (page 528) uses this language in approval of such method:

"The first and most important contention of the plaintiff is, that if the statute had been in force during any one of
160 the three years preceding its passage, the defendant companies would have been compelled to use their property for the public, substantially without reward, or without the just compensation to which they were entitled. We think this mode of calculation for ascertaining the probable effect of the Nebraska statute upon the railroad companies in question, is one that may be properly used."

The telephone business is yet too young to enable the making of calculations for the future from which results can be reliably ascertained. It is largely in a transition state, especially so as to switchboard construction, and exchange service. There are unexpired patents on some of the improvements, and patentable improvements are constantly being made; and while there are some instruments free from patent rights, it is claimed the best instruments are subject to royalties. The contracts of the defendant company with the Bell Telephone Company and the Western Electric Company require the defendant to pay annually about $8.50 per telephone for receivers and transmitters used by subscribers, and for drops on the switchboard in the central office. For this, however, and by virtue of their contracts, they are to have the use of all such patents as the Bell Company now owns or hereafter acquires, so that it may be regarded as an advantageous arrangement in all ways except as to cost, for it secures to the defendant and to each subscriber the best appliances obtainable.

The evidence shows that the books of the defendant were well kept, and that they were fully examined by the expert accountants, with papers and vouchers; that its business was carefully

conducted, with reasonable economy, considering the
161 quality of the service rendered and the novel character of the business; that the total amount expended for the purchase of real estate and construction of the plant to the date of December 31st, 1897, was $568,711.15; that the charges to maintenance and construction, as appearing on the books, were correctly made, and that the cost of replacing the present plant, or the value of the plant as it then existed, was, at the time of the passage of this act, $441,436.55. The number of miles of underground conduits laid is 13½ more than half of the same being laid under asphalt pavements. These conduits are made of vitrified terra cotta ducts, with manholes at certain distances, and the cables or wires are drawn through these ducts from manhole to manhole, as they are required for new subscribers. This is called the drawing-in system, as distinguished from the solid conduit system, previously in use. The cost of additional ducts to provide for future growth of business is very trifling, as compared with expense of opening streets and digging trenches and constructing manholes; and it is in evidence that some three or four thousand additional subscribers could be served by cables to be drawn in the vacant ducts now maintained, if they should be obtained in locations convenient to said conduits.

Before reaching this style of conduit, the defendant spent $115,000 in solid conduits and cables, which were afterward abandoned because of being inaccessible for the purpose of
162 making repairs or change of lines. It appears by the evidence that it is customary for telephone companies generally to charge a higher rate for telephones placed in business houses than for those in residences, and also a higher rate for those beyond a certain distance from the central office; and it also appears that in many cities in this country, and also in Europe, telephone service is supplied by the Government, or by corporations at rates which appear to be less than what those are as fixed by this Act; but as they are usually rated as business or residence subscribers, and not wholly dependent on the number of telephones on one line, and as they are in places differing so widely in many respects from this city, no exact comparison can be made, either as to the productive capacity of the rates, or as to the necessary cost of the plant and equipment, or as to the efficiency of the service. In the places where this cheaper telephone service is had, the cost of construction and maintenance is usually less than it is possible for it to be in this District. In some places it is almost wholly aerial construction, with no prohibition against erecting poles or stretching wires across streets and alleys, or attaching them to house-tops, as appears to be the case in some of the European

cities; and in some of these cities, companies are allowed to stretch their cables through the sewers, without the expense of laying conduits in streets. In many other cities, however, the rates for telephone service are higher than those in vogue in this District. In Grand Rapids, Michigan, and perhaps some other cities, where testimony was taken, there were rival companies, causing competition; and where it was shown
163 that nearly every subscriber had two telephones, one belonging to each company. The result in such case is necessarily more inconvenient, confusing and expensive than to have only one company. The rates of some companies are only regulated by mutual contract, without competition; others, with competition; while as to others, the rates are fixed in the charters or by ordinances or statutes of the municipal or state governments. As a rule, the average distance from the central office in these other cities where testimony was taken, is much less than in this District; and telephones of the independent companies, so-called, have no such advantageous connections with long distance lines as those in this District have. The companies furnishing the lower rates have generally been in business only a short time, and it is not clear from the evidence that they can make any profits at the rates charged, and at the same time keep up the plants in good condition.

There are certain contingencies that must be anticipated. Depreciation of overhead plants and of underground plants must be calculated upon and provided for. What is known as electrolysis frequently interrupts the lines and threatens the destruction of the cables, and is an enemy requiring constant watching in underground construction. This is frequently caused by the escape of electric currents from the trolley wires or electric light wires, and it melts or destroys the protecting coverings of the cables. In overhead construction, sleet and windstorms and large fires often do great damage. The natural life of telephone poles is about ten years. With a new company these things are not so carefully considered in mak-
164 ing up statements as to the annual income and profits, experience being required to arrive at any certainty as to the business being profitable or otherwise. The books of these independent companies were not shown and not examined by experts.

Taking all these differences into consideration, there can be very little comparison which can be relied upon between the several cities where the cheaper rates prevail, and this District; and consequently the greater part of the evidence taken by the complainants should be given less weight in determining the question now under consideration than the evidence showing the actual experience, requirements and contingencies, of

this particular locality. What some other company can do in some other place, where the conditions are essentially different, wages lower, as in Europe, prices of materials less, construction on a different plan, distance from central office less, business center of city well defined and near by, and where there are many other differences in the character of the people, the methods in which business is conducted, and in other matters, cannot aid the Court very materially in ascertaining whether the rates fixed by this Act, on a different basis from any of these, will afford a just remuneration to the defendant for the kind of service supplied in this District, under the circumstances under which the business here has been developed and maintained; and the Court ought, therefore, to give greater consideration to the facts derived from the experience of the defendant, than to theories of experts who are without any experience in this particular field.

Based largely on this experience, fully shown by the
165 expert accountants, Haskins and Tompkins, and being satisfied that the Company had been managed with reasonable prudence and economy, employing no more help and buying no more materials than was necessary, and that it has given the best service which could reasonably be expected, having the most approved appliances and employing men and women who are, well skilled in their particular departments, I am convinced beyond any reasonable doubt, after disallowing all expenses in the past experience about which there is any room for fair difference of opinion, that the defendant cannot continue to render the same efficient service to subscribers located throughout this District that it has heretofore, without incurring greater expense per subscriber than the maximum rates fixed by this Act.

On this principal issue, I am compelled to hold that the averment of the answer is sustained by the proofs, and it is not necessary to undertake to determine here how much money should be set aside for the depreciation of plant or other contingent expenses, or how little reward on capital invested will satisfy the rule that requires some return to be possible.

Having reached this conclusion, after considering all the facts and circumstances of the case proper under the authorities to be considered, and making all allowances which seem to be required by the conditions shown, it follows, as a matter of course, that these rates are not, in my judgment, just and fair as between the defendant and the public. No person has a right to compel another person to furnish him telephone service or other service or property at less than its cost; and
166 Congress has no power to pass a law which must necessarily have that effect. No doubt Congress can, by a

proper law, that will be unobjectionable on Constitutional grounds, regulate the rates to be charged by the defendant; and the Court need not consider whether the charges heretofore made by the defendant and agreed to by the subscribers were higher than they ought to have been, to be fair and just to the public. These questions are not raised for judicial opinion. The Court has no power to fix rates. That is for Congress, or the contracting parties, to do; and it is not for the Court to impose terms on the defendant on which it can continue to do business here, nor to criticize its lawful contracts, its sole duty being to decide from the evidence, guided by the principles of law, as laid down by the Supreme Court, and directly binding on this Court, so far as the same are applicable to this case, whether or not the rates fixed by the said Act are reasonable or unreasonable.

It is claimed by the defendant that it has been for some time endeavoring to make contracts on what is known as the measured service plan, instead of the flat rates; that by such contracts a more equitable rate is obtained, as then the man who has thirty thousand calls a year pays ratably more, and the man who has six hundred calls a year pays ratably less than would be the case under the flat rate system. It appears that this method has been largely adopted in many cities. About eighty per cent of the business in New York, where the flat rates are much higher than those heretofore prevailing in this city, is now being conducted on this plan; and it is
167 claimed that such system of charging will solve the vexed problems, and will largely remove objections caused by inequality. If this is correct, it would seem only fair that any company doing business here should have the right to make such contracts.—It would doubtless be unfortunate for this city, the capital of the nation, to be obliged to have unsightly poles or house-top fixtures, or second-class instruments, or poor construction, or unsatisfactory service, if something better could be obtained at rates that were satisfactory and just.

It would also be a misfortune to have two or more companies doing a general telephone business here. It would not only require two or more telephones in each subscriber's office, where it was necessary for him to talk with the city generally, but the construction of conduits and lines would keep the streets torn up, and inconvenience the public, much more than to have the lines all in the control of one company.

The court, cannot, however, consider the probable happening of either of these unfortunate conditions, in deciding this case. Congress and the Commissioners must determine the policy to be pursued as to the care of the city, and the number and char-

acter of the corporations who may be allowed to carry on the telephone business in this District, or whether the same shall be carried on by the Government itself.

Without stating further reasons, or making deductions from the voluminous testimony on other points, I am clearly of the opinion that this provision of the said Act is unconstitutional, by reason of the fact that the rates fixed thereby are un-
168 reasonably low for the service and supplies to which it must be considered they refer; and, on the whole case, I must, therefore, decide that the injunction *pendente lite* should be dissolved, and the bill dismissed.

The same decree should be made in all the other cases which are consolidated with this.

JOB BARNARD,
Justice.

169 *Decree Dissolving Injunction, &c. Filed,* February 28, 1900.

In the Supreme Court of the District of Columbia.

JAMES F. MANNING *et al.*,
vs.
CHESAPEAKE & POTOMAC TELEPHONE COMPANY.
} No. 19,558. In Equity.

This cause came on for final hearing upon the pleadings and proofs, and was duly argued by counsel for the respective parties in interest, and upon consideration, it is this 28th day of February, 1900, Ordered, adjudged and decreed that the preliminary injunction heretofore granted in this cause be and it is hereby dissolved, and that the bill of complaint be and it is hereby dismissed with costs.

And it is further ordered, adjudged and decreed that the damages sustained by the defendant by reason of the granting and continuance of said preliminary injunction amount to Two Hundred and Thirty-Eight 98\100 Dollars; that the complainants shall pay the said sum to the defendant within thirty days from the date of this decree and that in default of such payment, the defendant shall have execution as at law.

JOB BARNARD,
Justice.

170 *Order Allowing Appeal, &c., Filed,* March 8, 1900.

In the Supreme Court of the District of Columbia.

J. FORREST MANNING and HARRY E. RUPPRECHT, trading as J. F. MANNING & CO., Complainants,
vs.
THE CHESAPEAKE & POTOMAC TELEPHONE COMPANY, a corporation, Defendant.
} No. 19,558.

Upon motion of the complainants it is this 8th day of March, 1900, ordered that their appeal duly taken from the decree passed herein on the 28th day of February, 1900, be, and the same hereby is allowed, upon condition nevertheless, that they enter into an appeal bond the surety to be approved by the Court, in the sum of one thousand Dollars ($1,000.00).

JOB BARNARD,
Justice.

171 In the Supreme Court of the District of Columbia.

J. FORREST MANNING and HARRY E. RUPPRECHT, trading as J. F. MANNING & CO.,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY, a corporation.
} No. 19,558. In Equity.

The President of the United States, to The Chesapeake and Potomac Telephone Company, Greeting:

You are hereby cited and admonished to be and appear at a Court of Appeals of the District of Columbia, upon the docketing the cause therein, under and as directed by the Rules of said Court, pursuant to an Appeal allowed in The Supreme Court of the District of Columbia, on the 8th day of March, 1900, wherein J. Forrest Manning and Harry E. Rupprecht, trading as J. Forrest Manning and Co., are Appellants, and you are Appellee, to show cause, if any there be, why the [judgment]*—decree—rendered against the said Appellants, should not be corrected, and why speedy justice should not be done to the parties in that behalf.

Witness the Honorable Edward F. Bingham, Chief Justice of the Supreme Court of the District of Columbia, this 8th day of March, in the year of our Lord one thousand nine hundred (1900.)

JOHN R. YOUNG,
[SEAL.] *Clerk.*

*Word in brackets erased in copy.

Service of the above Citation accepted this 10th day of March, 1900.

A. S. WORTHINGTON,
Of Counsel for Appellee.

172 *Memorandum.*

March 13, 1900—*Appeal Bond—Filed.*

Stipulation. Filed, April 13, 1900.

In the Supreme Court of the District of Columbia, Sitting as a Court of Equity.

J. F. MANNING & COMPANY,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.
} In Equity. No. 19,558.

In the preparation of the record for appeal in this case, from the Supreme Court of the District of Columbia, to the Court of Appeals of said District, it is stipulated that the following shall be omitted by the Clerk from said record, to wit:

First: The order to show cause why injunction should not be issued.

Second: The eight affidavits of Haskins and others attached to the answer of the defendant to the rule to show cause and the Bill of Complaint.

Third: The affidavit of A. A. Birney, Esq., on the application for injunction, filed July 26th, 1898.

Fourth: The affidavit of Mr. S. M. Bryan, filed July 27th, 1898.

173 Seventh: Opinion of Mr. Justice Hagner, filed September 6th, 1898.

Eighth: Defendant's Exhibit No. 1, being copy of the Charter of the Chesapeake and Potomac Telephone Company.

Tenth: Those parts of the defendant's exhibits No. 5 crossed out by pencil marks, being a copy of the mortgage of the Chesapeake and Potomac Telephone Company, dated June 1st, 1891.

Twelfth: Defendant's exhibit "Parnell No. 1," being the piece of wire.

Thirteenth: Senate Document No. 39, Fifty-fifth Congress, Second Session, being information as to telephones in foreign countries, furnished through the State Department.

Fourteenth: The telephone systems of the continent of Europe by A. R. Bennett.

A. S. WORTHINGTON,
J. M. WILSON,
Attorneys for Defendants.
Per E. W. VAN DYKE.

April 13, 1900.

BIRNEY & WOODARD,
HEMPHILL & PETER,
Attorneys for Complainants.

174 *Order Extending Time. Filed,* April 25, 1900.

Supreme Court of the District of Columbia.

J. F. MANNING *et al.*, Complainants,
vs.
THE CHESAPEAKE & POTOMAC TELEPHONE COMPANY, Defendants. } Equity. No. 19,558.

It appearing to the Court that sufficient time is not allowed under the rule of the Court for preparing and filing the transcript in this case on Appeal to the Court of Appeals of said District: It is on motion of the Compainants Solicitors this 25th day of April, 1900 by the Court—

Ordered—That the time for filing said transcript in this case be extended until & including May 15th, 1900.

JOB BARNARD,
Justice.

175 *Stipulation as to Omissions from Transcript. Filed,* May 7, 1900.

In the Supreme Court of the District of Columbia.

JAMES F. MANNING *et al.*,
vs.
CHESAPEAKE & POTOMAC TELEPHONE COMPANY. } Equity. No. 19,558.

It is this seventh day of May, 1900, stipulated and agreed between counsel for the respective parties as follows:

First: That there may be omitted from the transcript of the record to be made up for the Court of Appeals the printed lists of materials designated as defendant's Exhibit No. 10 and the charts or diagrams known as defendant's exhibits 14, 15, 17, 19, 20, 21 and 22, but it shall be competent for either party in any

appellate Court to refer to said charts and lists and produce the same for the examination of the Court.

It is also stipulated that the transcript shall contain only the first two of the letters from Patent Office Officials offered by the defendant as exhibits to the testimony of the witness DeLacey. It is agreed that in addition to the said two letters to be copied, there are twenty (20) letters of similar purport and this fact is to be admitted in any appellate Court.

A. A. BIRNEY,
Of Counsel for Complainants.
A. S. WORTHINGTON,
Of Counsel for Defendant.

50,000.

176 *Order of Extension. Filed,* May 14, 1900.

In the Supreme Court of the District of Columbia.

J. F. MANNING & Co.,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY. } Equity. No. 19,558.

It appearing to the Court that the transcript on appeal in this case cannot be conveniently filed within the time heretofore limited, it is this fourteenth day of May, 1900, on motion of the Solicitors for the complainants,

Ordered, that the time within which said transcript may be filed be extended for thirty days from the 15th day of May, 1900.

JOB BARNARD,
Justice.

177 In the Supreme Court of the District of Columbia.

JAMES F. MANNING *et al.*,
vs.
THE CHESAPEAKE & POTOMAC TELEPHONE COMPANY. } Equity. No. 19,558.

Testimony on Behalf of the Defendant.

November 22d, 1898—3.30 o'clock p. m.

Met by agreement at the office of the President of the Chesapeake & Potomac Telephone Company, 619 Fourteenth street, N. W., Washington, D. C., for the purpose of taking testimony on behalf of the defendant.

Present on behalf of the complainants, Mr. Arthur A. Birney and Mr. J. J. Hemphill.

Present on behalf of the defendant, Mr. Jeremiah M. Wilson and Mr. A. S. Worthington.

186 SAMUEL M. BRYAN, a witness of lawful age, called by and on behalf of the defendant, having been first duly sworn, testified as follows:

Direct examination.

By Mr. WORTHINGTON:

Q. State your full name, age, residence, and occupation, if you please? A. Samuel Magill Bryan; age 51; residence, Washington, D. C.; occupation, President and General Manager of the Chesapeake & Potomac Telephone Company.

187 Q. How long have you been president of the defendant Company? A. Since March 3, 1887.

Q. Were you connected with the company at all before that? A. I was.

Q. During what period, and in what way? A. I became its general manager February 14, 1884; a portion of the time I was its Treasurer, and afterwards became Vice-President, and General Manager.

Q. And then President? A. And then President.

Q. Has your connection with the Company been continuous in one or the other of all these capacities since you first became connected with the Company? A. Since the beginning it has been continuous.

Q. To what extent have you had opportunities, in performing the duties pertaining to these offices, to become acquainted with the business and affairs of the Company? A. I have had the best of opportunities, because in order to familiarize myself with details I have been led to go into all matters connected with the Company and its operations.

Q. Where is your office as president of the Company? A. At 619 Fourteenth street, Washington.

Q. And where are the Central Offices of the company and its Exchange machinery? A. We have several central offices: in Washington, Baltimore, Westminster, Frederick, Hagerstown, Cumberland, and in Martinsburg, West Virginia.

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Q. What territory is covered by the operations of the Company? A. The Company covers the State of Maryland, the District of Columbia, and a portion of West Virginia.

Q. Where are the books, and the managing officers of the company to be found? A. Generally at the General Offices of the Company, 619 Fourteenth street, Washington.

Q. Where is the Exchange machinery for the operations of the company in the District of Columbia? A. It is in the same building containing the general offices 619 Fourteenth street, Washington.

Q. Since you have been President, what part of your time, in general, has been spent in Washington, in this building, where your office and the central business of the company, are located? A. On an average, between 9 and 10 hours a day.

Q. To what extent have you made yourself familiar with the mechanical and financial operations of the company? A. I have made myself familiar with the mechanical and financial operations of the company to about as full an extent as the duties of my office would permit.

Q. Are you prepared to tell us how many telephones of the several classes covered by the act of Congress involved in this inquiry, this Company had, at the date of the passage of the act of June 30, 1898, and what would be the amount which
189 the Company would receive from each of those classes at the rates fixed by the statute? A. I can say that we had at the date of the passage of the act about 2200 telephones, and that the revenue that the Company would derive from those telephones at the rates fixed by the act would be about $90,000.

Q. Have you a statement giving this matter more in detail? A. I have.

Witness produces the statement referred to, and the same is offered in evidence by counsel for the defendant, and is appended hereto marked Defendant's Exhibit No. 3, the same being in the words and figures following, *to wit*:

June 30th, 1898.

Grounded Circuit.

1055 One-party lines, at $50.00 per annum.....	$52,750.00
69 Two-party stations, at $40.00 per annum.....	2,760.00
33 General circuit stations, at $25.00 per annum....	625.00
18 Switchboard stations, at $25.00 per annum.....	450.00
	56,785.00

Metallic Circuit.

536 One-party lines, at $50.00 per annum.....	$26,800.00
55 Two-party stations, at $40.00 per annum.....	2,200.00
11 Three-party stations, at $30,00 per annum.....	330.00
19 General circuit stations, at $25.00 per annum....	475.00
207 Switchboard stations, at $25.00 per annum....	5,175.00
	34,980.00
190 (1175 Stations) Grounded circuit revenue....	$56,785.00
(828 Stations) Metallic circuit revenue.....	34,980.00
	91,765.00

Q. Have you a similar statement with reference to the situation of affairs on the 31st day of October, 1898? A. I have.

Witness produces statement last referred to, and the same is offered in evidence by counsel for defendant, and is herewith filed, marked *Defendant's Exhibit No. 4, the same being in* words and figures following, *to wit*:

Grounded Circuit.

1010 One party lines, at $50.00 per annum	$50,500.00
64 Two-party stations, at $40.00 per annum	2,560.00
32 General Circuit stations, at $25.00 per annum	800.00
14 Switchboard stations, at $25.00 per annum	350.00
	54,210.00

Metallic Circuit.

532 One-party lines, at $50.00 per annum	$26,600.00
55 Two party stations, at $40.00 per annum	2,200.00
11 Three-party stations, at $30.00 per annum	330.00
20 General circuit stations, at $25.00 per annum	500.00
291 Switchboard stations, at $25.00 per annum	7,275.00
	36,905.00
191 Grounded Circuit Revenue	$54,210.00
Metallic Circuit Revenue	36,905.00
Total	91,115.00

Q. Mr. Bryan, into what divisions or departments is the business of this company divided? A. It is divided into general office, construction, and equipment; those are the divisions of the office, not of accounts.

Q. What are the heads into which the accounts are
192 divided? A. They are divided under the heads of General Expense, Maintenance, Operating, and Construction.

Q. What is included under the head of General Expense? A. All the expenses that appertain to all the exchanges, the affairs of the entire Company, such as the Auditing Office, the Salaries of the Clerks in the Auditing Department and Treasurer's office, salaries of the President and his staff, and of the General Manager and his staff, etc.

Q. What is included in the maintenance account? A. Under the head of maintenance are included all the charges or expenses that are incurred in maintaining the plant in proper working condition.

Q. What are included under the head of operating expenses? A. Under that head are included the expenses of the operating room, consisting of salaries of the Chief Operator, his assistant chiefs, and the operators at the switch-board.

Q. What are included under the head of Construction and Equipment accounts? A. Under the head of Construction are included all charges for tangible additions to the betterment of the plant.

193 Q. Taking the general expense first, is there any separate account kept of the proportion which belongs to the Washington business? A. In the general books, no; but in the distribution of accounts for the different exchanges, each exchange is charged with that proportion of the general office expenses that the income of that exchange bears to the total income.

Q. In what does that result, so far as the Washington business is concerned? A. The result is that the Washington business is charged with about forty per centum of the general expense.

Q. What is the proportion of the Washington branch of the general revenues? A. About two-fifths.

Q. As to maintenance, are the accounts of the Washington business kept separate from the other parts of the business? A. In the distribution they are kept separately.

Q. How is that as to the operating expenses? A. They are kept absolutely separate from the others.

Q. And as to construction? A. The same.

Q. What can you tell us, from your connection with the Company, as to whether or not it has kept books of account showing its expenses and receipts in detail? A. It has kept books of account ever since my connection began with it, and has continued to keep them in what has been understood to be the most approved manner.

194 Q. Do your duties as President call upon you to supervise the business of keeping the books as well as the other branches of the business? A. Only in a general way.

Q. In the performance of your duties are you called upon to refer to the books or to call for their contents frequently? A. I am.

Q. From your experience derived in this way what can you say as to whether the books are accurately kept? A. From my experience it is my conclusion that they are accurately kept and scientifically kept.

Q. What is your knowledge as to whether, at any time any entries had been made upon them except those which represent the transactions as they actually occurred, and at the time they occurred? A. I have never had any reason to be-

lieve that any entry was made at any time that did not represent an actual transaction.

Q. From your experience and knowledge what can you say as to whether or not any actual financial transaction of the Company has been kept from the books? A. Nothing in the way of a business transaction of the Company has ever to my knowledge been kept from the books.

Q. Who, at present, is in charge of the book keeping department of your office? A. Mr. H. W. Bulkley.

195 Q. By what title is his office known? A. The Auditor's Office.

Q. How long has Mr. Bulkley been in your office? A. About two months and a half.

Q. Who preceded him as Auditor of the Company? A. Mr. J. E. DeSaules has been acting auditor for two three years past, since the resignation of the former Auditor.

Q. I wish you would tell us what, if anything, the Company has been in the habit of doing to test the manner in which the books are kept? A. It is the custom, and has been since the organization of the Company, to have a licensed auditor or a public accountant examine all the books of account, and vouchers of the Company, including the stock books, once each year, and certify the result of his examination to the President of the Company for submission to its stockholders.

Q. What has been the result of that test as applied to the books? A. The result of that has been that no errors or omissions have been developed.

Q. Who, at present, is the head of that department of your office which relates to maintenance? A. There are two: Maintenance of the outside plant comes under the General Superintendent of Construction, Mr. Augustus P. Cren-

196 shaw; and the maintenance as to inside lines, whether in the offices or in the premises of subscribers, comes under the control of the electrician and superintendent of equipment, Mr. Joseph E. Crandall.

Q. I wish you would explain more fully between inside and outside maintenance. A. The outside maintenance relates to all the plant of the Company outside of the Company's Exchange until it reaches the point of entrance to the premises of the different subscribers; the maintenance of the wires, equipment, etc., within the Exchange or within the premises of the Company's different subscribers, comes under the control of the Electrician and Superintendent of Equipment.

Q. How long has Mr. Crandall held his present position? A. He has occupied his present position, but not under the same title, for the past seventeen years.

Q. How long has Mr. Crenshaw held his present position? A. About seventeen years.

Q. Who, at present, is in charge of the operating department in Washington? A. Mr. Burnet L. Nevius.

Q. About how long has he been in charge of the operating room? A. About twenty years.

Q. Who is in charge of the construction department in Washington? A. The office of construction is divided
197 precisely the same: The outside construction of the Company being under charge of the Superintendent of Construction, Mr. Crenshaw; we make this distinction—that in one case it is construction, and the other construction equipment.

Q. I will ask you a general question as to those heads of departments of whom you have been speaking: What is your knowledge as to their ability to perform carefully and economically the duties of their respective offices? A. My opinion of them is best expressed by stating the fact that I have seen fit to advise their retention for all these years, and I regard them as admirably qualified in all respects.

Q. What department of your business, or what person has charge at present of the matter of purchasing such supplies as are required for the telephone business in Washington? A. The purchases are in charge of Mr. H. W. Upperman; he is the purchasing agent, and attends to the purchase of all material and supplies used by the Company.

Q. How long has he held that place? A. For the past three years.

Q. In your capacity as President do you have anything to do with the matter of supervising purchases made by Mr. Upperman? A. I have. As General Manager it is my duty to go over every item of proposed purchase, inquire into the
198 necessity for it, and go somewhat into detail as to the correctness of the prices to be paid.

Q. What is the process through which purchases were made, so far as relates to the prices which are to be paid, and making them at proper rates? A. Nearly or quite all of the materials and supplies purchased by the Company are authorized after competitive estimates or bids to the purchasing agent from supply houses, except in cases where it is necessary to use patented appliances that we can only get from some particular house.

Q. Is that because some particular house controls the patent? A. Because it controls the patent or is the sole agent for vending such supplies.

Q. From your acquaintance with the business what can you say as to the degree of care that is exercised in making purchases in order to maintain economy? A. I can say that the greatest care is exercised daily in all matters of that kind.

Q. You say such care is daily exercised; how long has that been the custom? A. Ever since I entered the service of the Company—fifteen years ago nearly.

Q. Are the materials which you use in your business purchased from time to time as they are needed, or do you keep quantities of supplies on hand and draw on the supplies
199 as required? A. Wherever we can purchase more advantageously in considerable lots we purchase that way.

Q. In what way? A. In large lots. We purchase in large quantities where more advantage can be obtained by doing so. Otherwise we purchase as and only when the supplies are needed.

Q. Then in the purchase of a large lot what is the process by which it is determined, how much shall be purchased and what shall be paid? A. The amount to be paid for it is determined by obtaining the lowest quotations from the different vendors of that article, whatever it may happen to be, and comparing that price with the prices of small quantities of the same article.

Q. How is it determined what shall be bought and in what quantities? A. That is determined by the representations of the construction department, the Electrician's and Equipment Departments, after full conference on the subject between the General Manager and the heads of the Departments.

Q. Does the purchasing agent have anything to do with it? A. He has to do with obtaining prices, but he has nothing to say as to the amount to be purchased.

Q. Does any part of this matter of purchasing supplies come before the Board of Directors? A. All estimates for
200 each succeeding month are placed before the Board of Directors at its meeting preceding the time when the supplies are supposed or assumed to be needed, and the Board of Directors passes upon every expenditure, large or small, for supplies.

Q. How many Directors do you have? A. Nine.

Q. What is your knowledge as to whether, at any time, any purchase has been made of anything for the Company which was not required for the proper use of the Company in its business? A. I have never known of any such purchase being made.

Q. Does the Company do any part of the work of construction itself, or does it employ contractors to do it? A. It employs no contractors, but does all its work under its own supervision.

Q. In the matter of construction by the Company, what, if anything, is done toward securing economy of expenditure? A. The Company relies upon its construction chief and his subordinates to look out for its interests in that way, and the

only method by which it can be determined that it is geting the full value of the money expended, is by a comparison with other works of a similar kind in other localities, and also by comparing the work it is doing and has done with similar work done in former years under contractors.

Q. Who makes those comparisons and those in-
201 quiries? A. That duty devolves upon me, and I have pursued it to my satisfaction.

Q. In this matter of construction, state whether any money has been spent, so far as your knowledge goes, which was not required by the business of the Company A. Not a dollar, to my knowledge, has ever been spent that was not required in the prosecution of the business of the Company.

Q. Mr. Bryan, you have spoken of your staff here in the General Office; who are the general officers of the Company, and what are their titles? A. The general officers of the Company are the President, Vice-President, General Manager, Treasurer, Secretary, and Auditor.

Q. You are the President? A. Yes; and General Manager.

Q. What salary do you receive? A. Eight thousand dollars a year.

Q. How long have you been receiving that salary? A. Since July 1, 1890.

Q. Is that your salary for attending to the duties of the Washington office, or for attending to all the business of the Company? A. It is my salary for attending to all the business of the Company throughout its entire territory?

Q. And the salaries of the other officers to whom you have referred, does that apply to all the business of the Com-
202 pany? A. Yes.

Q. The same as yours? A. Yes, sir.

Q. Who is the Vice-President? A. The Vice-President's office has been vacant until a few months ago, when Mr. Arthur G. Fuller was made Vice-President.

Q. Who is Treasurer? A. Charles G. Beebe.

Q. How long has Mr. Beebe been the Treasurer? A. Since December 15, 1884.

Q. What is his salary? A. $3,000.

Q. How long has that been his salary? A. Since February 1, 1893.

Q. What do you say as to that being a reasonable salary for the services Mr. Beebe renders? A. I do not consider the salary either unreasonably low or unreasonably high, for the services rendered, and the responsibilities of the position.

Q. Who is the present Secretary? A. Mr. Horace W. Upperman.

Q. How long has he been the Secretary? A. Since November 9, 1895.

Q. What is his salary? A. His salary is $2100 a year as Secretary and Purchasing Agent.

203 Q. What do you say as to the reasonableness of that compensation for such service? A. I think that compensation is fair, and only fair.

Q. Who is the Auditor? A. Mr. Bulkley.

Q. What is his salary? A. His salary is $2,000 a year.

Q. I will ask your opinion as to the reasonableness of that salary. A. I regard that as a very low salary if he is the Auditor we hope he will be.

Q. What was Mr. DeSaules' salary when he was in charge of the Auditor's Department, before Mr. Bulkley was appointed? A. $1500.

Q. What is your opinion as to that being a proper compensation? A. That was a very reasonable compensation. Mr. DeSaules has been chief clerk of the Auditor's office for a long time, and has been Acting Auditor when there was no auditor.

Q. What is the salary of Mr. Crandall? A. Mr. Crandall's salary is $2100 a year.

Q. And Mr. Crenshaw's? A. The same.

Q. How long have they been receiving that salary? A. Since June 18, 1898.

204 Q. What is your judgment as to whether that is a reasonable compensation for the services which they render? A. From the Company's point of view it is very reasonable.

Q. What is the salary of the Chief of your operating room here in Washington, Mr. Nevius? A. $1200.

Q. How long has he received that salary? A. Since January 1, 1891.

Q. What do you think as to the reasonableness of that compensation? A. I think it is very reasonable.

Q. Are there other subordinates employed in Washington whose salaries are smaller than those you have mentioned? A. Yes; but not as heads of Departments.

Q. They are employed under the heads of Departments? A. Yes.

Q. I want to know generally how, in your judgment, the compensation which those subordinates receive compares with a reasonable compensation for their services? A. Compared with New York, Boston, or Brooklyn, we pay less.

Q. I want to know whether in your judgment it is reasonable? A. I consider the compensation very reasonable.

Q. I will ask you whether, now, or at any other time, so far as your knowledge goes, anybody has been employed and

205 paid, either by way of salary or otherwise, whose services were not reasonably and properly necessary in the con-

duct of the business of the Company? A. I know of no such employment at any time.

Q. I would like to ask you on that subject, in conclusion, what is your judgment as to whether any reduction can be made in the number of employees of the Company whether salaried or otherwise, or in the compensation which is paid them, without detriment to the best interests of the Company? A. I do not believe any reduction could be made in salaries without detriment to the Company; nor do I believe that there could be any reduction of the force without serious detriment to the Company, inasmuch as additional employees are only taken on when it is found, by night and Sunday work, that we cannot possibly get on without an addition.

Q. It appears, upon inspection of the act of Congress in question here, that it prescribes a level rate of $25 to $50 per annum for exchange subscribers; are there any differences among the exchange subscribers, either in the service which they require of the Company, and in the expense of connecting them with the exchange, or in the manner in which the business with the Company is transacted? If so, what are the differences? A. There is a great difference in the cost to the Company of connecting and maintaining metallic circuits and grounded
206 circuits, and a great difference in the expense to the Company of serving the different subscribers in each class.

Q. Explain the difference between a metallic circuit and a ground circuit. A. A metallic circuit consists of two wires connecting the subscriber with the exchange in such a way as to make the circuit continuously metallic.

Q. You mean the electric circuit? A. The electric circuit. A grounded circuit is made by the use of one wire which is connected with the ground at the subscriber's end, and with the ground at the exchange end.

Q. Do you use the same kind of wire in each case, or a different one? A. Ordinarily for a grounded circuit we use the steel wire, while for the metallic circuit we use copper wire at about five times the expense per mile of single wire, making ten times the expense when the two wires are considered in the place of one.

Q. Do I understand that two miles of copper wire will cost ten times as much as one mile of steel wire? A. Yes. In addition to the difference between the expense of running the two wires is the difference in expense of equipment; a different bell is used in a metallic circuit from that used on a grounded circuit, and three cells of battery are required to operate a metallic circuit where one is used for the grounded circuit;
207 again, the maintenance of a metallic circuit line is very much more expensive than a grounded circuit line, for

the reason that a grounded circuit line, so long as it is suspended free from extraneous contact, will work wherever it may happen to be suspended, or however much it may sag; while, on the other hand, a metallic circuit line must be maintained practically in what might be called parallelism—one wire parallel with the other; and in case there is any undue sagging of one wire more than in the other wire, the line becomes noisy and will not work satisfactorily. Therefore the maintenance of a metallic circuit is vastly more expensive than is the case with a grounded circuit.

Q. What is the difference, if any, in the benefit to the subscriber, between a metallic circuit and a grounded circuit? A. With the grounded circuit the subscriber is troubled with noises that are picked up—earth-induction, or in the case of subterranean cables with what is popularly known as cross-talk, that is to say, when talking with some other subscriber, he may hear—and nearly always does hear—the conversation of other parties on other wires through the same cable; while, with the metallic circuit, he is not only freed from that annoyance, but is placed in a position where, if his business requires it, he may be connected with any one of the different cities of the United States within the range of the long distance telephone system and do his talking from his own telephone, in place of being
208 compelled to go to a public pay station.

Q. Prior to the passage of the act of June 30, 1898, in question here, what difference, if any, did the Company make in its charges to exchange subscribers, between those who had metallic circuits, and those who had ground circuits? A. For those who had metallic circuits the difference was $60 a year, within a radius of one mile, the grounded circuit being, for business houses $100 per annum, and the rate for metallic circuit being $160 per annum. But in 1894, that rate was reduced to $125 per annum, at which price it stood at the date of the passage of this act, there being a charge of 25 per cent more for metallic circuits than for grounded circuits.

Q. Can you tell us now how that additional charge of 25 per cent for a metallic circuit corresponded with the increased expense to the Company of the metallic circuit and the grounded circuit? A. The 25 per cent was after considerable experimenting decided to be about what was a fair increase to the Company for the decreased expense of furnishing the service.

Q. What is your judgment as to whether that difference was any more than a fair compensation? A. I regard the difference as one entirely fair, and rather in favor of the subscriber than in favor of the Company.

209 Q. Rather in favor of which subscriber? A. The metallic subscriber, rather than in favor of the Company.

Q. Were there any differences between the amount of service required of the Company by the different exchange subscribers? A. A very great difference, some subscribers requiring only about one call per day, while others required as high as seventy or more per day.

Q. Prior to and at the time of the passage of the act did you have any different rates applicable to subscribers who belonged to the different classes, according to the number of calls they made? A. About two years ago we published measured service rates, with a view of adjusting matters, so that the small user should pay for what he used, and the large user pay for what he used; but we had not, up to that time, made any difference between the large and the small user, except in cases of freight depots and such like institutions that required a continuous service sometimes for several hours at a time.

Q. What difference did you make with subscribers of that character? A. We charged subscribers of that character double the ordinary subscription price.

Q. Are there any differences between your subscribers with respect to the distance from your central office? A. Yes; the standard applied within a mile radius of the central
210 office, counting the distance by air line, and beyond that distance a charge was made of $6.25 for each additional quarter of a mile in the case of grounded circuits, and $10 for each quarter of a mile beyond the mile radius in the case of metallic circuits. We have also always made a difference between business houses and residences. The standard rate for unlimited service for residences with grounded circuits has been, since 1883, $72 per annum; and since the metallic circuit was established, the rate for metallic circuits for unlimited service at residences, has been $100.

Q. How did that compare with corresponding rates for business houses? A. The rates for business houses were $28 in excess of residence rates for grounded circuits, and $25 in excess for metallic circuits.

Q. What is the explanation of that distinction between residences and business houses? A. The distinction was made because residences were not supposed to make such frequent use of the telephone as business houses. The average experience of all telephone companies in the United States, including this one, was, and has since been that residences do not make great use of the telephone, but a very small use as compared with business houses.

Q. What is the difference in expense to the Company between establishing a telephone in an office, say within a quarter of a mile of your exchange, and one two miles away? A.
211 The difference would be the expense of additional wire

and the time required in making the necessary trips to and from the office in installation, in addition to the continuing expense of maintaining the additional mile and three-quarters of wire, and the expense of inspection, which is one of our largest items of expense, in going two miles away to maintain in proper condition a subscriber's station as against going one quarter of a mile; in the one case an inspector might take care of thirty telephones a day, whereas in the other case he might take care of only three or four or five.

Q. Please explain what you mean by inspection; tell us what inspection involves? A. Inspection involves looking out for any one of the large number of troubles to which an individual telephonic apparatus is subject; any one of the numerous contacts may be corroded; there may be a speck of dust in the receiver or in the transmitter; there may be a failure or break in the battery circuit or ringing circuit. While for these details I should prefer that you would ask those immediately in charge of them, I know enough about the subject in general to know that all telephones in the premises of subscribers are subject at any moment to accident that cannot possibly be provided against by any reasonable amount of foresight.

Q. Is there any difference in the style of apparatus with which the places of business of your exchange subscribers are equipped, aside from what you have already spoken of
212 when referring to the difference between metallic and grounded circuits. A. There is. We furnish, as an extra attachment to the standard equipment, a desk set something similar to this on my desk—a movable desk stand—and a handsome cabinet that stands against the wall which we frequently have made to match the woodwork, and a desk at which one may sit down and telephone or write, or anything of that kind.

Q. Are these various kinds of equipment furnished at the same price, or at different prices? A. The standard price for each of the different kinds is the same, but they do not come within the charge for the standard equipment.

Q. You mean they are extras? A. They are the subjects of extra charge in every case.

Q. Are there any differences between your subscribers in regard to the manner in which they pay, whether they pay annual rates or pay for measured service? A. All contracts provide for quarterly payments in advance, whether for measured service or otherwise.

Q. I want to know what is the difference between the measured service and any other service? A. The difference between a measured service and the unlimited service is that in the measured service the minimum number of calls that may

213 be contracted for by any subscriber for measured service is 600, the standard rate for which within the mile radius is $66, and the cost of service depends upon the number of calls contracted for or used; whilst with the unlimited service a flat rate is paid and no questions are asked as to the number of times the telephone is used.

Q. Before I forget it I want to ask you a question that I omitted, and that is as to what is the salary and what has been the salary, of the Vice-President of the Company. A. For many years there has been no Vice-President of the Company. Recently there was a member of the Board of Directors selected for that position, but he receives no salary up to this time, and never since the organization has there been any salary named for the office of Vice-President.

Q. Does he receive any compensation at all from the Company? A. None whatever.

Q. Mr. Bryan, it has been suggested that, by reason of the reduced rates fixed by this act of Congress, the number of your subscribers will be largely increased and that in that way you will be compensated for any immediate loss from reduced rates. What do you say to that?

Mr. BIRNEY: I object to that question as vague and uncertain, and because if it be intended by this question to ask the opinion of the witness upon the probable effect of the
214 statutory rates, it has not been shown that he has any knowledge which would make him competent to answer.

Mr. WORTHINGTON: In view of the objection, I will change the form of the question without changing the nature of the inquiry:

Q. What has been your experience and observation as to whether an increase in the number of subscribers causes an increase or a decrease in the expense attending the service furnished each subscriber? A. The experience of this Company in the business and the experience of Telephone Companies generally has been—

Mr. BIRNEY: I object, that the answer is not responsive to the question, and the witness is proceeding to state matters of hearsay and not of experience.

The WITNESS: I am speaking from experience. I say simply that my experience is that the cost of furnishing the service to each subscriber increases as the number of subscribers to each exchange increases.

By Mr. WORTHINGTON:

Q. Have you made any special investigation or study of that question? If so, to what extent? A. I have made a study of it in Baltimore and in Washington, and have found that the

percentage of expense increases in much greater ratio than the number of subscribers increases.

Q. When you say the percentage of expense increases, do you mean the total percentage, or the percentage for each
215 subscriber? A. I mean the percentage of expenses per subscriber increases much more rapidly than the total number of subscribers increases.

Q. Can you state any facts coming within your experience and observation, which show how this result is caused? A. The explanation of that is somewhat difficult, but I will endeavor to make it clear: If there are 1,000 subscribers to an exchange, a man has the power to select from the remaining 999 those with whom he desires to converse; and if the number ended with the 1000 we could make an accurate calculation as to what the outcome was to be year by year; but when we add to that number 200, we not only add 200 talking subscribers, but we add 200 subscribers with whom all the other 1,000 are immediately placed in connection, and with whom they may talk, and the number of calls per subscriber as the number of subscribers to each exchange increases, is largely augmented, the exchange grows, and the necessary attention to the subscriber's stations, to the operating, and to all the other matters pertaining to the maintenance of the system have to be increased.

Q. Will you tell me whether or not you have made any investigations from time to time as to whether the number of calls for each subscriber increases or decreases as the number of subscribers increases? A. Yes. From time to time we test
216 that matter, and as a result we find that in a period of about 10 years in Baltimore the number of calls doubled, and within about the same period in Washington, they practically doubled, running from four and a small fraction up to more than 8 per subscriber per day.

Q. When a new subscriber is placed in connection with the exchange what does it require in order to give him facilities to communicate with all the other subscribers? A. It requires that we shall run a wire, or a pair of wires, as the case may be, from the exchange to the subscribers' premises, in some cases necessitating some pole construction; and it requires that we place at the end of that line or that circuit a complete equipment, and at the other end connect the circuit with the switchboard, and by means of the switching devices in that board connect him with all the other subscribers to the exchange.

Q. Are there any unusual occurrences which impose expense upon the Company at uncertain intervals? A. There are many things that cause loss to the Company, and have caused great losses, such as windstorms and sleet storms, which have broken our wires, and windstorms have carried away all our poles and wires, making necessary entire reconstruction for districts.

Q. What was the last great storm that injured the plant of the Company? A. I think it was in Septemb r, 1896.

Q. To what extent did that damage your appur-
217 tenances? A. The damage was very general, and in some cases the pole lines were entirely down; and the total cost of replacing what was destroyed was between $15,000 and $16,000 or between $7 and $7.50 for each subscriber we then had connected with Washington exchange.

Q. Are there any difficulties encountered by reason of the electric current used by street railroads and street lighting companies? A. Yes, we have met with a great many difficulties of that kind, and have had to place in the ground a very considerable amount of copper in order to make proper returns of current sent out by these trolley lines, to the point of generation, the railroads not having made that return in proper shape when they built the roads.

Q. Can you give us any idea of the expense attending that sort of thing? A. I have not in mind the expense in Washington attending that kind of damage, but I do know that we were compelled to connect together twelve of our cables at the point where they enter this building in order to so distribute the damage that we would not have one of our long cables entirely destroyed until we could put copper wire in the ground so as to establish a proper return for the trolley current.

Q. Did that affect your underground conduits, or your over-
head wires? A. It does not affect the overhead wires—
218 only the underground cables; the effect upon overhead wires being simply to make the grounded circuit telephones in certain sections of the District so noisy that the subscribers have given them up or been compelled to take metallic circuits in order to secure effective service.

Q. I perceive that the charter of the Company which is in evidence fixes its capital stock at $50,000, with the right to increase it. What is the capital stock of the company at present? A. $2,650,000.

Q. How long has that been the amount of the capital stock? A. Since about the first day of August, 1883.

Q. Can you tell us whether or not that stock is now all outstanding in the hands of the stockholders? A. That stock is now outstanding in the hands of the stockholders.

Q. Were you connected with the Company at the time the capital stock was increased, so as to know of your own knowledge anything about it? A. I was not.

Q. Has the Company any bonded indebtedness? A. It has.

Q. What is the amount? A. There was an authorized issue of $600,000, of which $500,000 has been issued.

Q. Are those bonds secured in any way? A. Those
219 bonds are a first lien upon all the plant and property of the Company, real and personal.

Q. Is that in writing? If so, what is it? A. It is in the shape of a mortgage executed by the Company, and the trustee under that mortgage is the American Security and Trust Company.

Q. Will the facts in relation to the issue of these bonds, what was done with the proceeds, appear from the books? A. That appears clearly from the books.

A copy of the mortgage referred to by the witness is produced by counsel for defendant and offered in evidence; the same is filed herewith marked Defendant's Exhibit No. 5.

Mr. BIRNEY: I object to it as immaterial and irrelevant.

By Mr. WORTHINGTON:

Q. I observe that this mortgage provides for the creation of a sinking fund. Are you able to tell us whether or not the sinking fund has been kept up in accordance with the terms of the mortgage? A. It has.

Q. Do the facts in relation to that sinking fund appear also in the books of the company? A. Yes.

Q. From your knowledge as President of the Company, are you able to tell us whether or not, at the rates fixed by
220 the act of Congress in question here, the business of the Company will be done at a profit, or at a loss?

Mr. BIRNEY: I object, since that calls for mere speculation on the part of the witness, not dealing with experience, or any fact within his knowledge.

A. I am confident that it would be done at a loss; I know that it would be done at a loss.

By Mr. WORTHINGTON:

Q. Has any examination of the books of this Company been made recently by expert accountants for the purpose of determining what its receipts and expenses are, and what was the cost per telephone for doing business? A. We have had two investigations of that kind, one in 1894 and the other in 1898.

Q. Under what circumstances was the investigation made in 1894? A. That investigation was made in pursuance of an act of the legislature of the State of Maryland which authorized the Governor to appoint a commission to investigate and report upon telephone charges in the State of Maryland.

Q. Did that commission make a formal report to the general assembly of Maryland? A. That commission made a formal report.

Q. Is the printed document which I now show you a copy of that report? A. It is.

221 Said document is offered in evidence, and the same is filed herewith marked Defendant's Exhibit No. 6.

Counsel for complainants object to the document offered, as incompetent.

Q. In what way or by what methods did the Commission which made the report conduct the investigation which resulted in the conclusion formulated in that report? A. It conducted the investigation through the medium of a public accountant of Baltimore, Colonel John A. Tompkins.

Q. What opportunities did Mr. Tompkins have to make the investigation of the books referred to in his report, and the tables accompanying it, and forming a part of the report of the commission? A. He came to Washington with his assistants, was given a room, and all the books, documents, and papers belonging to the Company were placed at his disposal during the greater part of the summer of 1894.

Q. You have given the date of this investigation as 1894, when I see that the report which has been offered in evidence is dated 1896; what is the explanation of this? A. The explanation is an error on my part as to the date when the examination was made. The authority for the appointment of the Commission to investigate telephone charges in Maryland, was given in 1894, by the Maryland legislature, and the work was commenced and completed during the summer of
222 1895.

Q. What was the investigation to which we have referred that was made in 1898? A. That investigation was simply a continuance of an investigation begun by the Senate of the United States in pursuance of a resolution adopted by that body I think some time in March, 1898, authorizing the appointment of a committee to consider the question of telephone charges in the District of Columbia. But a few days after the appropriation bill having in it the rate amendment was passed by the Senate, the acting chairman of the committee asked that the committee be discharged from the further consideration of the question, because of the passage of this appropriation bill; but before the Senate had acted on the appropriation bill this committee had employed expert accountants from New York and brought them down to Washington, and those accountants had before them the books of this Company.

Q. Give the names of those accountants, please. A. Those accountants were Haskins & Sells—I do not know their first names; that is the firm, Haskins & Sells. Upon the discharge of this committee from further consideration of the telephone question, the acting chairman communicated with Mr. Haskins, who was a member of the firm, and who was then in Washington, and informed him that his services would be no

longer required. Whereupon, this Company engaged the same firm to continue the investigation upon the lines laid down by the Senate Committee, for the reason that I was in-

223 formed by the acting chairman of the Senate committee, and by Mr. Pitney, sometime acting chairman of the House Committee, that it was agreed, had Mr. Haskins continued in the service of the Senate Committee, that his conclusion should be the basis of action by both the House and Senate committees.

Q. You speak of Mr. Pitney being at one time acting chairman of the House Committee; to what committee do you refer? A. The Committee appointed to investigate and report upon telephone charges in the District of Columbia.

Q. Did Messrs. Haskins & Sells go on and make an examination of your books and formulate a report? A. They did go on and make the examination, and formulated a report.

Q. What was done with their reports? A. They were submitted to the House Committee referred to.

Q. I will ask you right here whether that was before or after the paragraph of the appropriation bill which is in question here, had passed the House and been adopted by the Senate? A. That was long after. The amendment to the bill in the House was made, I think, in the latter part of January.

Q. Of 1898? A. Of 1898. The Senate passed the appropriation bill with amendments, I think, in March, while the reports of Mr. Haskins were much later.

224 Q. You say that the Senate Committee had begun an investigation; had any inquiry or ascertainment been made by the Committee with reference to the affairs of this Company at the time they were discharged from the consideration of the subject? A. None, except that they had put their experts at work, and we had assigned them a room and submitted our books.

Q. Had any investigation been made by the House Committee in charge of this matter at the time the appropriation bill in question passed the House? A. None whatever.

Q. What opportunities were afforded Haskins & Sells before they made the report of which you speak, to ascertain the condition of the financial affairs of the Company? A. The fullest possible facilities, they being assigned a room, with *carte blanche* to order everything from our auditing department that they required in the course of their investigation, and with written instructions to carry on the investigation upon precisely the lines that had been laid down for their guidance by the Senate Committee.

Q. To what extent did they exercise their privilege as to books and papers? A. They exercised it to the extent of examining and checking every voucher.

225 Q. During what period? A. During a period of four years. And that not apparently being satisfactory to the Committee, they went back two years more, and checked everything, every paper that we had relating to the accounts of the Company, and the entries upon the books for six years, taking the years 1897, 1896, 1895, 1894, 1893 and 1892.

Q. During the time these investigations were going on what part, if any, did you take in the examination of the affairs of the Company for the purpose of ascertaining at what rates business could be done at a profit, and what would involve a loss? A. At the time these experts were making the examination of the account, I did not make any effort in that direction, preferring to have as little communication with them as possible, in order that their reports, such as they had to make, might be absolutely without bias one way or the other.

Q. Have you made any investigation of that kind independently at any time? A. We make investigations of that kind whenever we have the time to do it, by having extracts made from the books, and balancing one thing against another, as the head of any business concern would do, for the purpose of ascertaining how we were going, whether we were losing or making; and if making, how much?

Cross-examination.

226 By Mr. HEMPHILL:

Q. Mr. Bryan, you testified as to the prices you paid for material for construction and maintenance of your plant, and stated that you ascertained that it was reasonable by comparison with other companies. I wish you would state what the Company [that]* you compared with, and give us the different items, specifying what you paid for them, and what these other companies paid for them. A. I do not think I answered the question in that way. In that part of the examination I was more particularly referring to such work as underground construction. The way we compared that was by ascertaining what certain underground construction in various cities—New York, Brooklyn, Philadelphia, Boston and Cincinnati—had cost per foot of duct, taking the cost and dividing it by the number of feet of duct or cable capacity, and ascertaining how that cost per foot of duct agreed with what we were doing here, and considering the fact that in none of those cities did they have in any material degree the difficulties we have in this city, asphaltum pavements and some of them laid very deep, one layer upon another, to cut through at the beginning, and to replace at the close of the construction period.

*Word in brackets erased in copy.

Q. Is that the only way that you made comparison? A. That answer, as to the way we arrived at the proper prices for other materials, was given in a previous part of the examination.

227 Q. But what I want to get at is for you to take items now, specifying what they cost in other cities, and specify what they cost here, so that we can form some judgment, and not rely upon yours. A. I did not speak of items in my answer in my direct examination; I spoke of construction, and in speaking of that part of the construction I had in mind the underground, having previously answered questions in regard to the purchase of other materials.

Q. In answering that question did you have in mind anything except underground construction? A. No; because I had answered the question as to the purchase of other materials, in previous answers that I had given.

Q. Taking the underground construction, is it not a fact that it varies materially in different cities, according to the surfacing of the streets, whether asphalt or cobblestone or brick or wood? A. It does vary.

Q. Does it not vary also largely according to the depth you have to go? A. It does.

Q. Does it not vary according to the number of pipes and wires and other obstructions under the streets? A. That may have some influence upon it.

Q. Does it not vary also largely according to the depth that you have to go? A. It does.

Q. Does it not vary a good deal according to the price of labor in the cities? A. That would be an element.

228 Q. Would it not be the principal element? A. The principal elements are asphaltum pavements and depth; and in both those respects we in Washington contended with the worst conditions known in the United States.

Q. What depth do you have to go in Washington A. It varies.

Q. What depth do you have to go in New York? A. It varies.

Q. In Cincinnati? A. The same.

Q. In all the cities it varies? A. Surely. You may have to go over or under an obstruction, and it must necessarily vary.

Q. With all these variations that you have stated how is it possible to make a comparison? A. The conditions vary in a city, and they may vary in different cities; but when the total construction of a city is considered, the variations as to depth when brought to an average, will not materially differ one city from another. If in Brooklyn, for example, the minimum depth is two feet and the maximum eighteen, the average be-

ing eight, in Washington, we probably when we strike an average, would find that the average was also very nearly eight. So that while the different conditions in a city vary, when the summing up comes, as between one city and another,
229 the matter of depth would not be found to vary materially.

Q. Is that true with reference to the other conditions A. It cannot be true with reference to asphaltum as against cobblestone or Belgian block pavement, because those are fixed conditions. You do not get away from the asphaltum pavement in Washington.

Q. Then, as I understand, taking Brooklyn and Washington, so far as depth is concerned there is a general average which enables you to make a comparison? A. You would not make a comparison upon that average in that way; we would make a comparison upon a different basis. If we would put down 15 miles of trench, in which there were 500 miles of conduit, and we have 15 miles of trench in which there were approximately 500 miles of conduit, the cost in each city would be divided by the number of feet of cable capacity or conduit, and the cost per foot would be the basis of comparison.

Q. But the depth is one of the chief elements in determining the cost, is it not? A. That is one of the elements, but we found here that the chief element was the destruction of the surface of the street and its replacement.

Q. Next to that is not depth the most important? A. Next to that possibly the depth is the first thing to be considered.

Q. And as I understand you, the depths in this city
230 and in Brooklyn were practically the same? A. I do not say that they were practically the same; I said that they would probably round up about the same on the average, because the obstructions are met with in the streets of the cities, and they must be overcome in some way.

Q. That is just what I want you to state. What was the difference between any of these other cities and the city of Washington? You say that you have made comparison. Now let us have the benefit of that comparison. A. I have just stated that the comparison made was between the cost per foot of cable capacity in the completed ducts in Brooklyn, with the cost per foot of completed duct in Washington. We did not have to go to work to take measurements in Brooklyn and Washington, and we did not do it. It was sufficient for our purposes that we were, with all the conditions against us here, enabled to have made a foot of finished [duct work]* at the same or less price than they could complete the same work for, and of quite as high a quality as they could complete the same amount of work for in Brooklyn, Philadelphia or Cincinnati.

*Words in brackets inserted in ink.

Q. Then the only comparison you made was in the cost per duct foot of completed duct? A. Including manhole construction.

Q. That is the only comparison you made? A. Yes.

231 Q. What was the result of that comparison in figures? A. I think the result was—

Q. Not what you think—what you know, that is what we want. A. Our cost per foot of completed duct in Washington, manhole construction included, was something under 25 cents.

Q. What was it in New York? A. It was vastly in excess of that. That is hardly a fair comparison, because in New York they have more obstructions than we have here. But it would probably be fair to compare this city with Cincinnati.

Q. What did it cost in New York? A. I have never had a report of that, but have had a report from Cincinnati.

Q. What did it cost in Cincinnati? A. I speak now, not from my own personal knowledge, because I did not have supervision of the work. But I am advised that it cost about 25 cents per foot of duct without including the manhole construction.

Q. You do not know whether that is a fact or not; that is simply the report of the company? A. That is right—their statement to me.

Q. When was that made? A. Several years ago.

Q. About what year? A. I should think it was in the early nineties, possibly 1891 or 1892; maybe 1893, I don't know.

232 Q. What other cities have you investigated; give us a statement as to what it cost per foot? A. I cannot give you an exact statement of the cost per foot, the fact being that in making these inquiries the object I had in view was to see whether we were keeping our construction down? It seemed to me to be costing a good deal of money, and I wanted to keep it down as low as or lower than the lowest of any construction that was going on of that kind throughout the country.

Q. Do you know whether in Cincinnati they were placing their construction under asphalt or not? A. They placed a very small portion of it under asphalt, most of it being under stone pavement.

Q. What portion of it was under asphalt? A. I am not advised as to that.

Q. Did you ever ascertain? A. I never did ascertain the exact proportion?

Q. How are you able to state that any part of it then was under asphalt, or any part of it under stone? A. Because I am acquainted with the situation and know that some of the streets traversed were asphalted, and some were not. I had a personal acquaintance with the city of Cincinnati, and a pretty fair knowledge of its surface conditions.

Q. You do not know what the difference was? A. I do not.

Q. Did you get any reports from other cities as to the cost per duct foot? A. I had only a verbal report from Chi-
233 cago, and from that report it showed that at the time they were putting down the underground they had a somewhat less expenditure than we were making for ours; but in place of being cemented in the street, as ours was, for protection against damage, it was merely covered with a plank and buried in the street. That was a kind of construction I did not care to go into, and so I did not follow up that subject.

Q. So you really did not investigate that any further then? A. No, I did not care to. That was not the kind of construction that we approved.

Q. Is the cementing an expensive part of the business? A. It is; quite expensive.

Q. What does that cost per foot? A. I am not able to tell you what it cost per foot, but I do know that it requires a very large force of men to mix the cement and gravel together, and make the foundation for the terra cotta conduits and to protect the sides and the top.

Q. You do not know what that cost per duct foot? A. I do not know what it cost to cement per duct foot.

Q. What other cities did you have comparison with? A. We have had comparison with Boston; that was a matter of verbal information also; and we were under the Boston cost.

234 Q. What was that in Boston? A. I do not remember now what it was. They put down some terra cotta and some iron, and the figures I have not now in mind, except that I know that for the class of construction we were putting down I was anxious to ascertain the cost, without paying too much attention to the exact point at which the others had arrived.

Q. How much of Boston underground construction is under asphalt, and how much under other classes of pavement? A. That I cannot tell you.

Q. Do you know how deep it is in Boston? A. I know that it varies there as it does here.

Q. What is the average there? A. Except as a matter of guesswork I would not be able to say because they never advised me of that. I know in certain parts of Boston they cannot go as deep as we go here, because of tidewater.

Q. That statement you had from Boston was simply a verbal statement? A. That is all.

Q. You do not know whether that is correct or incorrect? A. I would not have any means of verifying it, whether verbal or written.

Q. Is there any other city that you can give us information upon. A. Very recently I had a conversation about St.

235 Louis and Kansas City when passing through, but the figures I do not have in mind now.

Q. That was after your construction was made? A. Oh yes.

Q. What is the extent of the underground system here? A. I do not exactly know. The figures are given in that book (referring to the volume containing the testimony taken by the House Committee.) There are about 125 miles of duct.

Q. I see on page 49 of that book that on September 1, 1897, the number of duct feet of the Chesapeake & Potomac Telephone Company was 696,034 and 9 inches. A. Who made that statement?

Q. That was made by the Commissioners. A. All right. I did not make it.

Q. Then what is the extent, if that is not correct? Was not your attention called to this last spring, before the committee of Congress?

Mr. WORTHINGTON: Which committee?

Mr. HEMPHILL. The House committee, investigating telephone charges.

A. Was not what?

Q. Was not your attention called to the number of duct feet set forth in this table here at the bottom of page 49? A. Yes, but I disclaimed responsibility for that table.

236 Q. If that is correct, say so; and if it is incorrect, state wherein it is incorrect. A. I do not want to criticise the Commissioners' report, or anything of that kind; but in some other part of that testimony, the number of feet is set out, if you can find it; I do not know what page it is on, but we gave the exact figures.

Q. Is this correct, or is it incorrect?—and if so, in what respect? A. I do not want to say in what respect. I would rather refer to the correct statement as given by us. On page 314 of that volume of testimony you will find a letter addressed to me by Mr. Crenshaw.

Mr. WORTHINGTON: We will state for the information of the gentlemen on the other side that we propose to put upon the stand the gentleman who has charge of that part of the work, and he can give you all the details.

The WITNESS. Somewhere in that book there is contained a statement from the Company.

Mr. WORTHINGTON: There it is, about the middle of page 314.

By Mr. HEMPHILL:

Q. I want you to state what the number of duct feet is. A. That is under the construction department of the Company, and I have to ask them for it, the same as you people will have

the privilege of doing before we get through. I would have to get it from the superintendent of construction if I gave it.

Q. Does the cost per duct foot vary materially according to the number of ducts you put into the conduit? A. I should say there would be a difference; but as telephone systems are practically all alike, beginning at the Exchange and running outward, we simply balance one thing against another, and calculate the cost per duct foot. There are certain conduits with a large number and some with a smaller number, down to one.

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Q. But I want an answer to my question. What I want to know is whether the cost per duct foot materially varies according to the number of ducts you have in the conduit. A. The only way I could answer that would be to say that the cost of a one-duct conduit would certainly be more than one-fortieth of a forty duct conduit.

Q. How much more? Can you tell us? A. No; nor could anybody else without the conditions were absolutely known and ascertained.

Q. How many ducts do you ordinarily have in your conduits? A. We do not ordinarily have any number; we put such number of ducts entering the Exchange as we think the present and prospective business of the Company will justify.

Q. How many is that? A. It depends upon the direction they go; if the telephone using section were south we would put in the greater number to the southward. It all depends upon circumstances.

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Q. Would a Company that had 10,000 subscribers have a larger number of ducts than a company having 2,000 subscribers? A. They might, or they might not, according to the judgment of the people having it in charge. If I had a 10,000 subscriber company I should feel like putting in more ducts than if I had 2,000.

Q. How many ducts do your principal conduits contain here? A. I really do not know.

Q. How far do your principal conduits run with the largest number of ducts? A. The question in that form is impossible to answer.

Q. How many ducts are there in the principal conduits of Cincinnati? A. I do not know.

Q. How many in Boston? A. I do not know.

Q. Or New York? A. I do not know.

Q. The number of ducts put into a conduit here depends, as you say, upon the possible needs of the Company? A. Yes.

Q. Do you mean that the same thing prevails in other companies or not? A. So far as I can understand, I think it does. I think they all have lucid moments sufficient

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to enable them to decide that question the same as we have here.

Q. Whether they have decided it as you have you do not know? A. I only know by hearsay; I do not know positively what is in their minds on that subject, but I have understood that we are all going in one direction, so far as that is concerned.

Q. Mr. Bryan, please state the number of subscribers of this Company, say on the first of January, of each year since you have been connected with it. A. That would be rather difficult, Mr. Hemphill. I have not that information before me, but I think that it was made up for the six years when the exhibits were prepared for the committee last spring.

Q. I do not recall that. It may be so.

Mr. WILSON. If you will turn to page 345 of the testimony before the House Committee, I think perhaps you will find what you want. You will find there the average in use.

The WITNESS: That is for the six years?

Mr. WILSON: Inclusive of 1897.

By Mr. HEMPHILL:

Q. When did you first become connected with the Company? A. In December, 1883.

Q. What position did you occupy then? A. The posi-
240 tion of general man, if I might call it so; it was no fixed position; I was simply to arrange any outstanding matter that the Company might have with the authorities or with individuals.

Q. As I understood your direct testimony, you became familiar with the affairs of the Company at that time? A. I did. I became General Manager of it on the 15th of February, 1884.

Q. In 1883 and 1884, and up to 1891, say, can you state the number of subscribers the Company had? A. It is impossible to carry that in one's mind, any more than it would be for a dry goods merchant to carry in mind the number of purchasers of his goods.

Q. Have you any data by which you can inform yourself? A. I think I can inform myself as far back as 1885; I do not know how far back I could go.

Q. I ask you to get up that data, if you please. What I want to get at is the number of subscribers, and you may select any day of the year, say the first of February or the first of January of each year, and go as far back as the time when you assumed charge. We would like also to have the number of employees.

Mr. WORTHINGTON: We shall introduce witnesses to prove all that in detail. We have not gone into these affairs with Mr. Bryan, simply because he only knows it from other sources.

Mr. BIRNEY: You may give the date that is most con-
241 venient to you, say the first of January or the first of July, but let the date in each year agree with the dates in the other years.

Mr. WILSON: Of course you understand that they are varying all through the year.

Mr. BIRNEY: Yes.

The WITNESS: The first of July would be a good time.

By Mr. HEMPHILL:

Q. Mr. Bryan, you state that the Board of Directors passes upon the expenditures of the Company? A. Yes.

Q. Do they do that monthly? A. They do, or as much oftener, as may be found desirable.

Q. Is that after the expenditures have been incurred? A. No, sir.

Q. Upon estimates? A. Estimates made for expenditures, except in case of emergency, where it is otherwise, because necessary for the protection of the Company.

Q. Who are the Directors? A. The directors are Charles J. Bell, Henry A. Willard, H. S. Cummings, Arthur G. Fuller and S. M. Bryan, of Washington; Mr. John H. Cahill and Mr. Joseph P. Davis, of New York State; and Mr. John E. Hudson and Mr. C. J. French, of Boston. Those constitute the nine directors.

Q. Do those gentlemen from New York and Boston attend every meeting? A. Not every meeting.

242 Q. How often are they here. A. Well, it depends. In the summer time we have to have them here sometimes in order to make a quorum, but they are not here in attendance so often as the Washington Directors.

Q. That is not a very close answer to my question. I asked you how often they attended. A. I do not remember how often. I will have to get that from the record. I cannot burden myself with details of that kind.

Q. Are any of these gentlemen that you have named officers of the American Bell Telephone Company? A. Yes, two of them.

Q. Give their names, please? A. Mr. Hudson and Mr. French.

Q. What positions do they occupy? A. Mr. Hudson is President of the American Bell Telephone Company and Mr. French is its general manager.

Q. I believe you stated in the examination before the House Committee that the American Bell Telephone Company owned a majority of the stock of this Company? A. If I did, it is on record.

Q. Is that a fact? A. I believe the record shows that to be the case.

Q. What is the proportion of its ownership? A. That I do not have in mind.

Q. Will you get the figures and get us that data, Mr. Bryan? A. It can be gotten up, I think, without difficulty.

Q. The question is, will you get it and give it to us?

Mr. WORTHINGTON: I suggest that requests of that kind might be addressed to counsel and not to the witness.

The WITNESS: I would rather have it so.

Mr. HEMPHILL: What do counsel say?

Mr. WORTHINGTON: We will look into the matter and let you know at the next meeting whether we can get it.

By Mr. HEMPHILL:

Q. Mr. Bryan, what was the name of the first telephone company doing business in this city? A. I do not know, except as I know from the record. There are some contracts in the record that seem to indicate what was the first telephone company; but I was not in the United States at that time, and I do not know.

Q. What do these records indicate?

Mr. WORTHINGTON: I shall certainly object to Mr. Bryan being called upon to answer what the records contain; the records are in evidence, and speak for themselves.

By Mr. HEMPHILL:

Q. Have you not informed yourself by investigation of the records of your company here? A. Yes; I have satisfied myself.

Q. Now what do you have to say, after satisfying your-
244 self? A. With regard to what?

Q. As to what was the first company. A. That is a matter that did not concern me, and I did not go into it—as to the first company. I did not have to go that far back to satisfy myself.

Q. What satisfaction did you reach then? A. I went back far enough to ascertain that the National Capital Telephone Company was doing business here.

Q. What company bought that out? A. The Chesapeake & Potomac Telephone Company.

Q. When did they buy it?

Mr. WORTHINGTON: Mr. Bryan, have you any knowledge on that subject?

The WITNESS: Only by hearsay. I was not in the Company at that time. Mr. Hemphill was asking what I satisfied myself of.

By Mr. HEMPHILL:

Q. Have you not in your possession the books of the National Capital Telephone Company? A. I think not; I never saw them.

Q. Do not the books of this company and the contracts of this company show that the present company purchased all the rights and privileges of the National Capital Telephone Company?

Mr. WILSON. The record shows.

Mr. WORTHINGTON: We are going to put that in.

Mr. WILSON. The contracts are already in evidence.

245 Mr. WORTHINGTON: This company bought out that that company, and that company bought out Maynard's company.

By Mr. HEMPHILL:

Q. What did this company pay the National Capital Telephone Company?

Mr. WORTHINGTON: We are going to put all that in evidence hereafter. Mr. Bryan knows nothing more about it than what the books show.

Mr. HEMPHILL: If you put that in, all right.

Mr. WORTHINGTON: We shall either put it in of our own motion, or, if we omit anything, and you call our attention to it the omission will be supplied.

Mr. HEMPHILL: Covering the purchase from the original company and the amount paid.

Mr. WORTHINGTON: Yes.

Adjourned to meet at 3:20 o'clock p. m. to-morrow, Wednesday, November 23, 1898.

246 Washington, D. C., *November* 23, 1898, 3.20 o'clock p. m.

Met pursuant to adjournment, at the office of the Chesapeake & Potomac Telephone Company, Washington, D. C.

Present on behalf of the complainants, Mr. HEMPHILL and Mr. BIRNEY.

Present on behalf of the defendant, Mr. WORTHINGTON and Mr. WILSON.

SAMUEL M. BRYAN resumed the witness chair and was examined.

By Mr. WORTHINGTON:

Q. Mr. Bryan, are you now prepared to give the information which counsel for the complainants requested yesterday as to the proportion of the stock in the defendant Company held by the American Bell Telephone Company? A. Yes, sir; the amount is 15,076 shares, or a par value of $1,507,600.

Q. The par value of all the stock being what? A. $100 per share.

Q. But the total par value of all the stock is what? A. $2,650,000.

Q. I will ask you whether the proportion of the stock of the defendant Company held by the American Bell Telephone Company has varied greatly from that in late years? A. It has not.

247 Q. Can you tell us whether or not any portion of that stock was purchased then in the open market, as other people purchase it? A. Upon information only, the only stock that they received from the Company—

Mr. BIRNEY: I object to that.

A. The amount of franchise stock is, I am informed, $690,000.

Mr. WORTHINGTON: I may say that that will appear hereafter from the books.

The WITNESS: If the Congressional proceedings are in evidence, it appears there.

Mr. WORTHINGTON: They are not in evidence.

The WITNESS: I did not know anything about that.

By Mr. WORTHINGTON:

Q. Are you prepared now to give the information which was requested by the complainants' counsel in reference to the number of subscribers at a certain time in each year, as far back as possible? A. Yes.

(The witness here produces a statement headed "Total number of exchange stations in January of each year, from 1884 to 1898, inclusive."

Said paper is offered in evidence by counsel for the Defendant, as part of the evidence of the Defendant, and the same is filed herewith, marked "Defendant's Exhibit No. 7," the same being in the words and figures following, *to wit:*)

248 *Total Number of Exchange Stations in January of Each Year from* 1884 *to* 1898, *Inclusive.*

1884	Number of Exchange Stations	954
1885	"	1096
1886	"	1182
1887	"	1299
1888	"	1429
1889	"	1481
1890	"	1599
1891	"	1678
1892	"	1722

1893	"	1819
1894	"	1805
1895	"	1802
1896	"	1814
1897	"	1822
1898	"	2106

By Mr. WORTHINGTON:

Q. Are you prepared now to furnish the information which was requested by counsel for complainants, as to the number of operators employed in the Washington Exchange at the corresponding periods? A. We have not been able to get that for the corresponding periods up to this time. We have only been able to submit it as far back as 1890, the past 8 years.

Q. Have you a list giving the information for those
249 years? A. I have.

(The witness produces a statement headed "Total number of operators employed in January of each year from 1890 to 1898, inclusive."

Said paper is offered in evidence by the counsel for the Defendant, as part of the evidence for the Defendant, and is filed herewith, marked Defendant's Exhibit No. 8, the same being in the words and figures following, *to wit:*)

Total Number of Operators Employed in January of Each Year from 1890 to 1898, Inclusive.

1890	Number of Operators.....	22
1891	"	28
1892	"	29
1893	"	30
1894	"	30
1895	"	30
1896	"	30
1897	"	30
1898	"	35

By Mr. WORTHINGTON:

Q. Why is it that you are unable at this time to give the number of operators in the preceding years in January? A. Because the procurement of that information involves an examination of the payrolls, and the records of the Company year by year are filed away. The data upon which this information is based is only obtainable after a very great
250 deal of labor and trouble. While it can be gotten at, it was impossible to get at it for this meeting.

Q. I understand you can furnish it, but cannot furnish it now? A. That is it.

Mr. BIRNEY: Then it will be furnished later?

Mr. WORTHINGTON: Yes.

The WITNESS: I would like to make a correction in my testimony of last night, in relation to the date when Mr. Uppermann, the Secretary and Purchasing Agent, was appointed to his present position. I think I stated it was in 1895, while the fact appears from the minutes, which I had not then time to consult, that he was made Secretary March 13th, 1894, and Purchasing Agent August 14th, 1894.

Cross-examination resumed.

By Mr. BIRNEY:

Q. Mr. Bryan, you have stated that the cost of connecting and maintaining a metallic circuit is greater than the cost of connecting and maintaining a grounded circuit; and as one of the elements of increased cost, you have mentioned the difference in the wire. What is the cost of the copper wire used in the metallic circuit? A. There is about 107 pounds of copper in a mile of the wire such as we use for these local connections. There is little less than 100 pounds of steel used in a mile of wire of the size that we use for a grounded circuit, local connection. The steel wire costs about 3 cents a
251 pound, while the copper wire costs about 15 cents a pound. There being two wires of copper, it would make the cost of the material, before it is strung, about 10 times as much in the case of a metallic circuit as in the case of a grounded circuit.

Q. Which is the more durable? A. Copper is possibly the more durable.

Q. How much more; do you know? A. I do not know.

Q. Your experience does not teach you anything in respect of that? A. The use of copper for telegraphic and telephonic purposes has not been sufficiently prolonged to enable anyone to state what is the life of a copper wire suspended in the air.

Q. What is the life of the steel wire? A. That depends entirely upon local conditions.

Q. What is its average life? A. Its average life, I should say, would be 10 years.

Q. In this locality? A. In this locality.

Q. Can you state the extent of the underground system of your Company in this City? A. I cannot state it except as I get the information from the Superintendent of Construction.

Mr. WORTHINGTON: I may say that he will be the next witness, and he will give you all that.

252 By Mr. BIRNEY:

Q. These wires are brought together in the form of a cable, are they not, to be passed through the conduits of the Company.

Q. How large cables are used by the Chesapeake & Potomac Company? A. That I would have to get from the Superintendent of Construction, who has the measurements and dimensions in his department. I have not.

Q. Do you not know the largest size? A. I do not know the largest size.

Q. Nor the smallest? A. Nor the smallest.

Q. Is there any sagging ever found in the cable in a conduit. A. Not that I ever heard of, except that the conduit, if its foundations are disturbed, may sag; but the wire laid up solid in a cable would hardly sag.

Q. Then when you spoke of the sagging of the copper wires used for the metallic circuit, where did you mean they are found to sag? A. I meant those suspended in the air from the point of junction at the cable pole to the residence of the subscriber.

Q. Do you employ any steel wires in the cables? A. No, sir.

253 Q. Then all your system in that part of the city in which you have underground conduits, is connected with the copper cables? A. Yes, sir.

Q. Have you the copper wire in use beyond that underground system? If so, to what extent? A. We have for our extra-territorial lines, and for our metallic circuit subscribers.

Q. Can you indicate the extent to which it is used for those objects? A. The extent to which it is used varies at different points. At some points we may have to run one distance from the terminus of a cable, and at other points, we would have to run a much shorter distance or a longer one, as the case might be.

Q. I ask for information in the aggregate. To what extent have you used, beyond your underground system, the copper wires, or copper connections? A. Wherever the superior service has been subscribed for, or required, we have used copper wire.

Q. The extent of that service you cannot indicate? A. That is a point in the statistics of our Company that we never found it necessary to go into so as to compile anything with exactitude.

Q. What wires do you employ in the overhead system? A. Steel and copper.

Q. What are the proportions of one to the other? A.

254 I am not able to say.

Q. The table, Exhibit Defendant No. 7, shows an increase in telephones from 1822, in 1897, to 2106, in 1898. What caused that increase? A. A desire on the part of residences and business houses to have telephone service, that were not already supplied with it.

Q. Was it not largely caused by the furnishing of telephones to the Government where they had not previously been? A. Not wholly, and not to a very large extent.

Q. How many new telephones did you install for the Government between the time when this number was taken in 1897, and the time when the number was taken in 1898? A. I do not remember the number. I will have to make an investigation to find out.

Q. Did you not install a large number through the Treasury Department? A. Between January, 1896, and January, 1897?

Q. No. A. Between what dates?

Q. Between January, 1897, and January, 1898. A. I think so. My recollection is that we did.

Q. About how many? A. I do not know.

Q. Will you give us that information? A. I think so.

Mr. WORTHINGTON: What is that request?

255 Mr. BIRNEY: I want the number of Government telephones from January, 1897, until January, 1898.

Mr. WORTHINGTON: And also the number taken out at any time, I suppose, so as to show the net increase in Government telephones?

Mr. BIRNEY: Yes; that will do.

Mr. HEMPHILL: We would like to know the rates that the Government contracted to pay for these telephones, and in which of the public buildings they are located.

By Mr. BIRNEY:

Q. In your examination in chief, you gave the opinion that the income of the Company at the statutory rates fixed by the act of June 30th, 1898, would be about $90,000. Was that estimate based upon the number of telephones now in operation by the Company? A. Yes, sir.

Q. Your territory covers not only the District of Columbia, but Maryland and West Virginia, does it not? A. A small portion of West Virginia.

Q. What portion is that, Mr. Bryan? A. I do not remember the exact terms of the license, but it includes the town of Martinsburg, with a certain territory around it.

Q. Does it include any other cities than Martinsburg? A. We have recently obtained a license for Piedmont, but have no service there.

Q. That is the only other town? A. The only other one.

Q. You have also given us the rates charged by your
256 Company in the City of Washington in a general way. What are the rates charged from your central station in Baltimore for similar service?

Mr. WORTHINGTON: We object to inquiries as to the rate in other cities than Washington, for the reason that that involves an inquiry ino the different conditions in those cities as compared with Washington, and it would make the inquiry here interminable.

A. The rates for metallic circuit telephones in Baltimore are identical with those in Washington. The rates for grounded circuit service were the same until an act of the legislature was passed in 1892, which reduced the rate to $78 in place of $100 for each telephone.

Q. And since that time they have been at that rate? A. Since that time they have been at that rate, such as have been in existence, but there are comparatively few grounded circuit telephones now in existence in Baltimore, the service there on the grounded circuits being so thoroughly unsatisfactory that the changes are going on week by week with great rapidity from the grounded to the metallic circuit service.

Q. How many telephones had you in use the last time you knew the number in Baltimore, and when was that?

Mr. WORTHINGTON: Suppose we let it be understood here, once for all, that all questions relating to the rates in Baltimore and other cities, shall be subject to the objec-
257 jection I have just made, without constantly repeating it.

Mr. BIRNEY: Certainly.

A. I have not in mind now the number of telephones in Baltimore. Did you ask it at any given date?

Q. At any recent date which you can furnish. A. I can possibly get at the information. I haven't it in my mind.

Q. If you can readily get at that, I would like to have it.

Mr. WORTHINGTON: At what date, Mr. Birney?

Mr. BIRNEY: At any recent date that is most convenient, say the first of July, 1898. I would also like the proportion of the grounded circuit to the metallic circuit.

By Mr. BIRNEY:

Q. What are the rates charged for similar service from your central station in Cumberland? A. I would have to have that compiled. I am not posted as to those country rates. I was at the time they were made, but I do not keep them in mind.

Q. Can you not tell us what is the charge made at Cumberland for service over a metallic circuit to a business house, or to a residence? A. I can only give you my impression,—that it is $72 a year.

Q. And for a grounded circuit? A. I have forgotten what that is.

258 What is the rate charged at Westminster? A. I am not advised as to that. I was familiar with the rates,

but I have not kept them in mind. I am less familiar with the rates at Westminster than I am with those at Cumberland, really.

Q. What are the rates charged at Hagerstown? A. I would have to make the same answer that I made in regard to Westminster. Those things are matters of record, but I cannot carry them in my mind.

Q. Are they matters of record in your office? A. Yes.

Q. Can you not readily obtain the information? A. The information can be obtained.

Mr. BIRNEY: Will you furnish us that, gentlemen?

Mr. WORTHINGTON: At what period? At the present time?

Mr. BIRNEY: At the present time, or any recent date, either the first of July or the first of October, whichever is more convenient. I would like also to have that information in regard to Martinsburg. I would like the number of telephones in use in each place and the rates charged.

Mr. WORTHINGTON: The number of metallic circuits and grounded circuit telephones, and the rate charged for each?

Mr. BIRNEY: Yes; we might as well have that, too, to make it complete.

By Mr. BIRNEY:

Q. Mr. Bryan, have you ever made any figures, which will support your statement that the cost of maintaining the
259 metallic circuit is greatly in excess of the cost of maintaining the grounded circuit? If so, when did you make that? A. Several years ago, I think in 1895, such figures were made. I do not know whether they are on file now or not, but I know that that question was up, and was gone into quite exhaustively at that time.

Q. By whom? A. By Colonel Tompkins, by our own accountants here, and by me.

Q. Did you preserve any of the data on which you made your examination? A. I did not preserve any personally. There may be some data preserved, such as I have worked on, and as the others have worked on, but I am not positive as to that.

Q. What year was that? A. 1895.

Q. Can you tell us again at what points you found the excess in cost?

Mr. WORTHINGTON: I object to that question as being too vague for the witness to intelligently answer.

Mr. BIRNEY: I refer to the excess cost of the metallic circuit over the grounded circuit.

By Mr. BIRNEY:

Q. What is it that makes the increased cost of maintenance? A. The first item is the character of construction neces-

260 sary to carry the metallic circuit. It must be of a superior kind, in order that the wires may always be carried parallel, and maintained in that position. The next item that occurs to me as an additional expense of maintenance is the maintaining of three cells of battery instead of one, the latter being used in the case of a grounded circuit.

Q. Is that the only other item? A. Those are the only things that occur to me at this time.

Q. Then the first increase is found in the cost of laying down the wires? A. I did not say so.

Q. Did you not say so? A. No.

Mr. WILSON: No; he did not say so.

By Mr. BIRNEY:

Q. What do you mean by the term "character of construction," as employed in your answer? A. I mean to say that there are many lines of poles with aerial construction, that would answer very well for use in furnishing grounded circuits, upon which we would not think of using the metallic circuit service, without strengthening or entirely replacing the line.

Q. Do you call that an item of maintenance? A. No, I do not, and I did not mean to refer to it as maintenance, except in the sense that it costs more to maintain in a state of effi-
261 ciency a superior pole plant of that kind than it does to maintain an inferior one.

Q. In what way? A. It has to be kept up to a higher standard.

Q. Where does the cost come in? What are the items of increased cost in maintaining that higher standard? A. It is necessary to have the wires always insulated, and perfectly so. If an insulator is removed, we must immediately replace it. If it is broken, or anything happens on any one of the poles, we must immediately go out and repair that line; while it frequently happens that a dozen insulators may be off on a grounded circuit line and the line not be materially affected.

Q. But your metallic circuit wires in this territory are all under ground, are they not, except that part leading from the poles into the subscriber's house? A. That is true, but even though it is true, a very large number of telephones are supplied with wires, half or even two-thirds of which are overhead.

Q. In that answer, do you refer to a metallic circuit? A. I do.

Q. In what parts of the city are those telephones? A. In all parts of the city, for the reason that fifteen or eighteen miles of conduit radiating in different directions from the company's exchange could not possibly run in each and all of those
262 directions to the limit of the District, and only embrace fifteen or eighteen miles.

Q. Then the overhead part of the metallic circuit system is found from the terminii of these conduits to the subscriber's house? A. Not necessarily at the terminus of the conduit, but at some point in the conduit system, where we drop off and run an independent conduit into an alley for the purpose of making a junction between the overhead and the underground.

Q. When you run into the alley from the street, do you not do that underground? A. Yes, sir.

Q. Do you excavate to the foot of the pole? A. Yes, sir.

Q. And then carry your wire up the pole, and from there into the house? A. We carry the cable up the pole, and there distribute, through a cable box, to the cross arms, and to the overhead wires, and then distribute, whether the distance be long or short, to the extent of the capacity of that cable that is run up the alley.

Q. Can you tell what proportion of your total metallic circuit system is thus carried overhead? A. That I cannot tell. It comes under the construction department, and the information is lodged there.

Q. What do the cells in your batteries cost? A. I am not advised of that definitely. That information is in the office of the purchasing agent.

Q. Have you any information on that subject? A.
263 Only my recollection of the quotations, which is very indistinct, and upon which I would not like to depend.

Q. What is that recollection? A. My only recollection is of the general quotations. We get price lists from different parties, and I have no information upon which I would like to base an answer to that question, inasmuch as it can be gotten at very accurately in another way.

Q. Do you know what is the average life of the cell in one of your batteries? A. I do not know what the average life of a cell is. I do not know whether an accurate calculation has been made as to that, because of the numerous conditions under which a battery must be compelled to do work.

Q. Can you state anything more definite as to the basis upon which you have made your estimate of the difference in cost of the two methods of service? A. I cannot, at this time.

Mr. BIRNEY: I do not think we can go any further until we get this other information. When we get that, I shall be prepared to conclude the cross-examination of this witness.

Mr. WORTHINGTON: I would like to go on with the redirect examination as far as I can.

Mr. BIRNEY: All right, we have no objection. I reserve the right of further cross-examination.

264 Redirect examination.

By Mr. WORTHINGTON:

Q. Mr. Bryan, upon comparing the number of exchange stations from 1884 to 1898, contained in Defendant's Exhibit No. 7, and the number of operators from 1890 to 1898, as shown in Defendant's Exhibit No. 8, I find that while the number of exchange stations increase from 1,599, in 1890, to 2,106, in 1898, or about 33 1-3 per cent, the number of operators during the same period increased from 22 to 35, or considerably over fifty per cent. I would like to ask you whether during that period, from 1890 to 1898, there was anything occurred by which an operator could attend to more or less subscribers than he could in 1890? A. I am unable to answer that question except from information furnished me by the electrician and chief operator of the company. That information is to the effect that the introduction of the latest switchboard, which I think was in 1894, gave to each operator very much less work in making one call or 100 calls than had been the case with any previous board in use.

Q. Will you tell us about what that new board cost? A. My information is it cost about $34,000. I am speaking from recollection, purely.

Recross examination.

By Mr. HEMPHILL:

Q. How many drops has that board? A. I do not
265 recollect.

Mr. WORTHINGTON: We will have on the stand, I may say, a gentleman who knows all about that board and the operating room, who can aswer questions in detail.

Mr. WILSON: We have not gone into it in detail with Mr. Bryan because we can give you the exact information by another witness.

Mr. HEMPHILL: Then we will let Mr. Bryan go until further cross-examination later on.

SAM'L M. BRYAN.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

266 AUGUSTUS P. CRENSHAW, a witness of lawful age, called by and on behalf of the defendant, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. What is your age? A. Thirty-seven.

Q. Where do you reside? A. Washington.

Q. How are you employed at present? A. I am General Superintendent of Construction of the Chesapeake & Potomac Telephone Company.

Q. How long have you held that position? A. Since April, 188[illegible].

Q. Were you connected with that company before that time? A. I was.

Q. In what way? A. As Superintendent of Construction. Prior to that I was in the construction force.

Q. From what time? A. Since September, 1878.

Q. In 1878 by whom were you employed, Mr. Crenshaw? A. By the Telephone Company. Mr. Maynard was at the head of it at that time.

Q. And afterwards when the National Capital Telephone Company became the owner of the system here were you in the employ of that company?

267 A. The ouside work is the plant or equipment of the company from its exchange to the outside of the window of the subscriber's place of business.

Q. Who has charge of that part of the work which is inside of the subscriber's place of business or residence? A. That is under the control of the Electrician and Superintendent of Equipment.

Q. What is his name? A. Joseph E. Crandall.

Q. How is it as to the work inside of the exchange here? A. Mr. Joseph E. Crandall has charge of all the equipment that is in the exchange.

Q. You have charge, I believe you said, of the work of construction as well as the maintenance, so far as it relates to what you have defined as the outside work? A. Yes, sir.

Q. Take the matter of construction first. We are dealing here only with the District of Columbia. All the questions which I will ask you, unless it otherwise appears, relate to the affairs in the District. When any new construction is to be done for the company, what is the process by which the work to be done is determined, and how it should be done, and the cost of it? A. I submit an estimate and plan to the general manager, which, so far as I know, he submits to the Board of Directors for approval, if he himself approves of it. I am

268 then authorized to proceed with the work. I then write a letter to the purchasing agent, stating the approximate amount of material that will be required in connection with this work, so as to enable him to obtain prices for purchasing this material. The material is then, of course, purchased, and is used under my supervision or that of my assistants.

Q. What, if anything, do you have to do with the fixing of the prices to be paid? A. For material?

Q. For material. A. Only to the extent of the class of material, as to whether it comes up to the specifications.

Q. Is there any inspection of material which is furnished in that way? A. It is always inspected by my department.

Q. How does the company perform the work of new construction, by itself or by contracts made with somebody else? A. By itself.

Q. Who employs the labor and fixes the prices to be paid for what is to be done outside of the obtaining of the material? A. That is done by my department with the approval, of course, of the general manager.

Q. What do you personally have to do with that matter?

A. All the items and details of the work come under my
269 direct supervision.

Q. How are materials obtained for the purpose of maintenance in your department? A. I suppose, of course, you refer to my department?

Q. Yes. A. Once a month, after going over with the storekeeper the amount of material on hand, I make up an estimate of the amount of material that will probably be required for maintaining the plant in proper condition during the coming month. That I embody in a letter to the purchasing agent to be embodied in his estimate of material required for the coming month, which is submitted to the general manager for approva . If it is approved by him it is further submitted to the Board of Directors for their approval.

Q. What, if anything, have you to do with the prices to be paid for material for maintenance? A. Nothing, except I require the material to come up to the proper standard.

Q. You have charge of the inspection of the material also when it is received? A. Yes, sir; I do.

Q. Where is the material kept which you have on hand for the purposes of construction and of maintenance? A. It depends upon the class of the material. What we call the regular stock material is kept at the warehouse.

Q. Is that in this city? A. In this city; yes, sir. The
270 material used in conduit construction is generally delivered on the line of the trench as we want it. Poles, of course, are either delivered on the pole pile or along the line being erected.

Q. Do you have under you any subordinates to assist you in the performance of your duties? A. Yes, sir.

Q. Who are they? Give us the names of the offices. A. I have a clerk, an assistant clerk, draftsman and engineer combined, two foremen and a cable inspector for my assistant force.

Q. Then you employ a number of laborers and men who are paid daily wages? A. Yes, sir.

Q. I want to ask you whether either in the construction or the maintenance branch of your department anything is purchased which is not required for the proper discharge of the business of the company? A. No, sir.

Q. And whether or not what is purchased is applied to the proper uses of the company and put to no other use? I am speaking, of course, of your department. A. As far as my department is concerned it is applied to the proper use.

Q. State what compensation your assistants whom you have enumerated receive? A. My two foremen and cable inspector receive $85 a month. One of my clerks receives $60 per
271 month; the other, $7 per week. The draftsman and engineer receives $20 per week.

Q. What is your judgment as to whether the salaries are reasonable for the services rendered by these men? A. I think the salaries are reasonable.

Q. What is your judgment as to whether the services of any any of these men could be dispensed with? A. They cannot be dispensed with without detriment to the interests of the company.

Q. Have you, at my suggestion, made a copy of some of the papers as a sample of the course of procedure of your department? A. Yes. Do you wish to see them?

Q. Yes. Just state in a general way what they are, first. A. The first is a carbon copy of a letter under date of November 17th, 1898, addressed to the Chesapeake & Potomac Telephone Company, Mr. H. W. Upperman, purchasing agent, furnishing him with a list of the material that will be required in my department in Washington for the month ending December 15th, 1898.

Q. Let me have that, please. (The witness hands paper to Mr. Worthington.) Is this fairly representative of the manner in which similar business has been conducted for a series of years? A. That represents it.

Mr. WORTHINGTON: I offer that paper in evidence.

272 The above paper is filed herewith, marked Defendant's Exhibit No. 9, and is in the words and figures following:

"THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY,
No. 619 Fourteenth Street N. W.

Washington, D. C., *November* 7th, 1898.

The Chesapeake and Potomac Telephone Company, Mr. H. W. Upperman, Purchasing Agent, Washington, D. C.

Dear Sir:—I herewith hand you a list of material that will be required by my department, in Washington, for the month ending December 15th, 1898:

1,000 Porcelain Knobs, No. 4.
10 lbs. of Grimshaw Tape.
10,000 1½-inch Locust Pins.
2,000 No. 12 B. & S. Connectors.
2,000 No. 12 N. S. B. Connectors.
10,000 feet of No. 16 Single Okonite Wire, 6—32 twisted, braided.
2,000 Special Pins.
2 gross of 2-inch No. 20 Screws.
100 miles of No. 12 B. & S. Copper.
2,000 lbs. of No. 12 Guy.
2,000 lbs. of No. 11 Guy.
1,000 lbs. of No. 14 Guy.
12 51-wire, No. 8 Fuse Strips, complete.
100 60d. Wire Nails.
6 pairs of Connecting Pliers.
273 2,000 lbs. of "O" Copper Wire.
12 25-pair Cable Boxes,
5,280 feet of No. 12 Weatherproof Wire.
5,280 feet of No. 16 Rubber Insulated Twisted Wire.
6 J. I. C. Buckets.
48 Screw Eyes.
6 9-16 inch Bolts.
1 Large Stone Paving Hammer.
5,000 ½-inch by 4-inch Lag Bolts.
500 3-inch Pipe Hooks.
1,000 1½ Ungalvanized Staples.
1,000 1-inch Ungalvanized Staples.
25 1-inch by ⅜-inch Machine Bolts.
12 pairs of Leather Gloves.
4 Steel Rods, ¼-inch c 18-inch.
2 21-32-inch Drill Bits.
2 25-32-inch Drill Bits.
2 Cant Hooks.
50 lbs. of Rosin.
1,000 Tool Receipts.
1 Stable Broom.
1 Book for County Pole Record.
25 gallons of Gasoline.
12 Hinge Hasps.
20 feet of ¾ c ¼-inch Brass Strips.
50 3-inch by 4-inch Tinned Staples.
6 panes of Glass, 8 by 10 inches.
1 Spool of Resin Solder.
274 1 Package of Matches.
1 Set of Tristed Drill Bits.
2 dozen Iron Bands.

1 Roll of Blue Print Paper.
1 Roll of Blue Print Linen.
1 Bottle of Carmine Ink.
1 Bottle of Brown Ink.
1 dozen Thumb Tacks.
10 yards of Detail Paper.
Lumber, $10.00.
Sundries, $15.00.
2 Bicycle Tires.
1 Barrel of Carbonizing Coating.
1 Horse Blanket.
6 Locks.
12 Street Lanterns.
1 Pole Stencil.
5 Loads of Sand.
4 Loads of Broken Brick.
2 Barrels of Portland Cement, and
3 Barrels of Rosendale Cement.

Yours very truly,

General Superintendent of Construction."

275 By Mr. WORTHINGTON:

Q. Have you produced any other form? A. I have here the form as used by my foreman in making detailed reports to me of work done. I have also a temporary receipt given the storekeeper by the foreman for material taken from the warehouse; and finally, a permanent receipt based on the temporary receipts for materials taken out, furnished the storekeeper by myself for the total amount of material taken out on that day. The day in question happened to be November 18th, 1898. This latter sheet goes to the storekeeper for his approval, finally going to the Auditor so that the proper account can be credited or charged.

Q. Who was the storekeeper? A. Mr. D. M. Steers. Mr. Worthington, probably you will not notice it, but it is a fact that the summary of the foreman's reports equals the material shown on the temporary receipts, whereas the final permanent receipt equals the material shown on either the temporary receipt or the foreman's reports.

The papers last referred to by the witness, being fastened together, are offered in evidence on behalf of the defendant, and marked Defendant's Exhibit No. 10.

The WITNESS: They are correct copies of the business
276 of November 18th as done by my department.

Q. I will ask you whether these last papers, comprising Defendant's Exhibit No. 10, fairly show the manner in

which similar transactions have been carried on in your own department for a number of years past? A. Fairly. There are some matters of detail that are a little different.

Q. Taking your letter to the purchasing agent, dated November 17th, 1898, Defendant's Exhibit 9, were the articles which are referred to there needed for maintenance only, or for both maintenance and construction? A. They are used for maintenance.

Q. Maintenance only? A. Yes.

Q. Do the other papers included in Defendant's Exhibit No. 10 relate to matters of maintenance only? A. They relate to the matter of maintenance only.

Q. For the purpose of better understanding your business, I take a sample of some of the articles mentioned in these papers, for instance, the first item of Exhibit No. 9: 1,000 porcelain knobs, No. 4." What are they used for? A. They are used in carrying the wires into the windows of a house, and from the roof down into the house.

Q. From whom do you get those knobs? A. The purchasing agent buys them. I do not know who he buys them from.

277 Q. Take the first item in Defendant's Exhibit 10: "Pony Glass, ins." What does that mean? A. Pony glass insulators.

Q. What are they used in? A. They are used in insulating the wires on the poles or housetops. When the insulators are broken we have to go over the line and replace them with others.

Q. Suppose that pony glass insulator is taken away by one of the workmen, for instance, before it has been put in place. Is there any way of ascertaining the fact? I want to see how closely you keep your accounts of these things? A. The foreman has to account for all the material which he takes out. If it is a little thing as small as a pony glass it is possible a man might slip it in his back pocket and get off with it, but it is not probable it would be of any value to him if he did.

Q. Is it possible under this system to keep a strict account of all these things so that anything of any consequence will not be missing? A. The foreman or sub-foreman accounts for all material used.

Q. You have to account for it on these forms in writing? A. We have to account for it in writing.

Q. Take at random another item of Defendant's Exhibit 9: "10,000 1½-inch Locust Pins." What are they? A. They

278 are pins that are placed in the cross arm on which the glass insulator is screwed down tight and the wire attached to it.

Q. I find another item near that on the same page: "10,000 feet No. 16 Single Okonite Wire, 6-32 twisted, braided." A.

That is what we call insulated wire, and it is used where we cannot keep the wire perfectly clear in getting into a building or other place.

Q. I would like to have your opinion, based upon your experience in these matters, as to the efficiency of the system which these papers evidence as connected by your testimony in economically and carefully administering the affairs of the company which relate to your department? A. I think they are very efficient. I did think when first adopted that they made almost too much clerical work on the inside to check them up properly, but there is a thorough check on the material.

Q. What is done in your department, towards keeping a record of the transactions of which you have charge? A. Just in what way?

Q. I want to know what books are kept, so that the operations of your department may be traced at any time? A. Of course we have those foremen's daily reports, as you see there. They are copied into what we call a daily record ledger. I have press copies of the requisitions on the storekeeper made
279 out on a basis of the material used by the foremen on those reports. I simply, for my own convenience, recapitulate that once a month, so as to show about the amount of each class of material I am using during that month.

Q. To what extent, in carrying on the business of your department, are you supervised by the President of the company, or any other superior officer? A. All estimates for material, or all work to amount to anything, is approved by, or I consult with, the general manager.

Q. What, if anything, have you to do in your department with the financial part of the business relating to your department? You have told us as to the matter of prices. You have not anything to do with the fixing of prices, but I want to know if there is any record in your department as to prices paid for material or for labor? A. No, sir; no special record is kept. I generally take a memorandum of bills that pass through my office for my approval, simply to avoid duplication in approving the same bill twice.

Q. About how many men are there employed in your department aside from the assistants of whom you have told us? A. At the present time?

Q. Yes. A. About 55.

Q. About how many were employed on an average
280 from day to day during the past two years? A. It depends upon the amount of work we have on hand, running from about 50 to about 65.

Q. What are the duties of those people, in a general way?

A. Keeping the lines in repair, cleaning out manholes, testing cables and repairing lines and poles generally.

Q. In a general way, what are they paid? A. It varies from $1.50 a day to $2.25.

Q. What is your judgment as to whether they are worthy of that hire? A. The men receiving higher wages are of course the higher grade men. They have the particular work to do. The $1.50 are the men we call the helpers. They are assistants to these other men. I think that is a very reasonable compensation. It is lower than is paid in other cities.

Q. What proportion of the 55 or 60 men are paid $1.50 a day? A. On that basis of 55, there are 27 $1.50 a day men.

Q. How many are there of the next higher rate, and what is it? A. The next higher rate is $2, and of that there are about 17.

Q. Go on. A. And of the third rate there are five
281 men at $2.25.

Q. As to these men who receive, say more than $1.50 a day, how long have they been in your employ on an average? A. It is pretty hard to average them. Some have been there as long as fifteen or sixteen years, and others have been there a year or two.

Q. In a general way, is there any difference made in a man's compensation as to whether he has been in the employ of the company a long time or recently? A. No, sir; it depends upon his ability.

Q. In giving the number of employees, are you speaking solely of the maintenance force? How is it when you have new construction? Do you do it with the same force, or employ additional help? A. I draw from the same force some of the men, and take on additional men.

Q. Those additional men are kept how long? A. As long as it is necessary, on account of this construction work, drawing the others from the maintenance force.

Q. How do you pay those new men whom you bring in to help with the construction work? A. It depends on the class of men I have to take. Practically the same wages. If I have to employ other climbers in place of the regular climbers, the climbers' wages are generally $2 or $2.25 a day.

Q. In the work of construction will you state how the number of men that you employ, and the wages that you pay them compare with what is required for the efficient performance of the work? A. I think we pay very reasonable
282 wages.

Q. How is it as to the number of men? A. We only employ the number necessary. The principal proportion of our construction work is underground conduits, which employs to a

very great extent a different class of men from the ordinary maintenance men we carry.

A recess was here taken until 8:15 o'clock p. m.

WASHINGTON, D. C., November 23rd, 1898, 8:15 o'clock p. m.

Direct examination of AUGUSTUS P. CRENSHAW, resumed.

By Mr. WORTHINGTON:

Q. Since you have held your present position, what classes of underground conduits have been put down by the defendant company? A. The conduit drawing-in system.

Q. Describe that briefly? A. The system put down in Washington is what is called the drawing-in system, using vitrified terra cotta pipe as the conduit. This is laid in a trench. An excavation is first made to the proper depth, which is governed by the obstructions met with in the street. A base of cement concrete, to a thickness of four inches, is placed in the trench, on which the first layer of conduit is placed. The second layer,
or as many additional layers as are necessary, are built
283 up over this bottom layer. The sides of the trench, to a thickness of 3 inches on the outside of the terra cotta conduit, are filled in with concrete grouting. Then there is a top surface of four inches of concrete grouting that attaches to the top of the conduit.

Q. Do the bottom, sides and top of this hydraulic concrete form one solid mass surrounding the conduit? A. They form one solid mass surrounding the conduit. The conduit is opened at intervals by what are known as manholes, built generally at intersections of cross streets, though occasionally it is found necessary, on account of obstructions, to place manholes between cross streets. I think that, probably, is a general description.

Q. Describe briefly how the manholes are constructed? A. The manholes are constructed by digging an excavation about two to three feet deeper than the bottom of the conduit, and building up four brick walls 12 inches in thickness, with an inside space of about 5 feet square. This is carried to within about two feet of the street surface, at which point it is covered over, or rather drawn in, with granite stone flagging of a proper size to admit of the top casting being placed on, which is a cover than can be locked, and by the use of a rubber gasket made watertight and airtight.

Q. How are the wires placed in these ducts, and taken out from time to time, as required? A. The wires are bunched
into cables of the desired size, and are drawn into the
284 ducts by first rodding the ducts and drawing in a large manilla rope, to which the cable is attached, and pulled in by the use of a winch.

Q. How many ducts are contained in these conduits? Give us the maximum and the minimum, and the average, as well as you can? A. In Washington we have a minimum of one, a maximum of 72 and an average of about eight and three-quarters.

Q. How many miles of conduits of the kind you have been describing has the company in the District of Columbia? A. You mean the conduits, not the ducts?

Q. I mean conduit miles, not duct miles? A. Fifteen and one-tenth miles.

Q. Since your connection with the company has it used any form of underground construction other than the one you have just described? A. Yes, sir.

Q. What was that? A. In 1884, 1885 and 1886 the company put in what was known as the solid system of conduits.

Q. Describe that, please? A. That is laid, as its name indicates, in a solid manner, by digging a shallow trench, either in the bed of the street or the sidewalk, in which three inches of asphalt are laid, mixed in about the proportion of the sheet asphalt street surface in Washington. Then the desired number of cables, allowing for a certain estimated growth, are laid on this surface and a filling of asphalt placed around and over them to the depth of four inches, which is covered by an
285 ordinary rough pine box, simply to hold the asphalt in position until it has hardened, when the street is refilled.

Q. Why do you speak of that as the solid system? A. We mean by it being a solid system, one solid mass. There is no space in there as there is in the drawing-in system.

Q. What was the reason for the change from the system which you have last described to the system now in vogue? A. There were several reasons. One is that the new system is much cheaper per duct. Another reason is that with the drawing-in system you can add your cables when you want them. You do not have to place more cable in the beginning. Another reason is that if a cable plays out or deteriorates in any way, if any section of it becomes useless it can be tested at the manholes, the point of injury found, drawn out, and a new cable drawn in; whereas, with the solid system, the street would have to be torn up in a large number of places, first to locate the trouble and then to repair it.

Q. What became of the cables that were placed in the ground under this solid system? A. They were abandoned and left in the ground.

Q. What use are they now? A. No earthly use.

Q. Can you give us any idea of the amount of money
286 that was sunk in that way? A. It has been some time since it was sunk, but my recollection is about $115,000.

Q. Are you able to tell us where the present system of underground conduits which you have described was first introduced? A. Which do you mean by the present; the drawing-in?

Q. The drawing-in system, yes. I mean whether it was in Washington or somewhere else? A. I do not know where it was first introduced. It was not in Washington. My impression is it was in Boston, but I am not at all certain of that.

Q. How many miles of duct has the company now in these underground conduits? A. About 132.

Q. That is in the City of Washington here? A. Yes, sir. It is understood, Mr. Worthington, that all of my remarks refer to Washington.

Q. That was stated at the beginning of your examination, unless otherwise expressed. Can you tell us how many miles of wire the company has in its underground and overhead system? A. Combined or separate?

Q. Combined, first. A. A little over 7,000. I can give you the exact figures; 7,352.05 miles.

Q. What proportion of that is copper and what proportion steel, if you can tell? A. Yes; I will give you the steel,
287 and the rest is copper; 1,457.03 miles of steel—steel and iron.

Q. Finally, can you tell us what proportion of the copper and what proportion of the steel is overhead, and what proportion underground? A. All of the steel is overhead. Of the copper there is 1,406 miles overhead. In other words, there is 1,406 miles of copper overhead and 1,457.03 miles of steel overhead.

Q. In connection with what kind of service is the steel wire used? A. In connection with what we call the grounded circuit.

Q. Exclusively? A. Exclusively.

Q. You have stated that your department has nothing to do with fixing prices at which material is purchased. Will you tell us to what extent, if at all, you become familiar with the prices in the course of the performance of your duties? A. I think I am familiar with all the prices.

Q. Tell us in a general way how you become familiar with them? A. I make up estimates for new work. I also make up statements to the general manager of the cost of different pieces of work, both construction and maintenance, at various times, as well as approving all bills for material as far as the quality of the material is concerned, which of course keeps me posted as to the price paid for the material.

288 Q. In attending to the matter of approving the bills, do you come in contact in the bills with the prices which are paid? A. Yes, sir; the bill, with its price per weight, etc., is handed to me for approval as to quality.

Q. What information can you give us as to the difference in cost to the Company between equipping the metallic circuit telephones and the grounded circuit, and connecting them with the exchange? A. I am not familiar with the entire difference, because a good deal of expense is connected with the inside department.

Q. As to the part of it which comes within your department, what can you tell us? A. As far as the part coming within my department is concerned, the principal difference is in the cost of the wire used. The wire used on the metallic circuit is of copper, requiring two wires, each wire weighing 104 pounds to the mile. The cost of that varies from 14 to 15 cents per pound. The wire used in connection with the grounded circuit service is what we call No. 14 steel wire, the price varying from 3 to 3⅝ cents per pound, weighing about 96 pounds to the mile.

Q. Is there any other difference between the two classes of service that comes within your cognizance? A. The metallic circuit service requires more than double the labor and double the space on a pole line, besides requiring both the
289 labor and the pole line to be of a better order and class than the iron construction.

Q. Why is that? A. One thing is on account of the extreme care that has to be exercised in tying copper wire, to keep from injuring it, and to keep the two wires level. Besides, the pole line has to be measured off, and transpositions put in, so as to kill the noise.

Q. What do you mean by transpositions? A. Every certain number of feet, for instance every 1300 feet, from where a metallic circuit begins, going towards a subscriber, the wire has to be crossed. In other words if they run on adjoining pins, the right hand wire has to cross over to the space of the left hand wire, and vice versa.

Q. Why is that necessary? A. That is necessary, as I say, to kill any cross talk.

Q. What difference is there in the length of time which the copper wire and the steel wire respectively will last? A. The copper wire has not been used long enough to get a very good test on it, but I should think the copper wire had about fifty per cent. more life than the steel wire.

Q. What is the lifetime of the steel wire, on an average? A. From about eight to ten years.

290 Q. Under what conditions does it vary? A. In the heart of the city, where there is a good deal of smoke and gas from chimneys, it rusts out very rapidly. In the outlying districts, on country lines, it lasts much longer.

Q. Upon what knowledge do you base your judgment that the life of a copper wire is only about fifty per cent more than

that of the steel wire? A. On the experience I have had with it in storms, and in repairing generally.

Q. To what extent is there a difference in the amount of expense required in installing telephones in your department, growing out of the fact that they are different distances from the exchange? A. The expense in connection with my department increases in proportion that the distance increases.

Q. Why? A. In other words, it takes about twice as much material and twice as much labor to run two miles of wire as it does to run one; and the same applies to the maintenance of the wire.

Q. Are the telephones connected with the exchange in Washington confined to any particular part of the city or District? A. No, sir; they are scattered pretty well all over the District; certainly all over the city.

Q. Give us an estimate as well as you can, of the difference in cost to the company of putting in a telephone, so
291 far as it comes within your department, a quarter of a mile from the exchange, and one two miles from the exchange? A. The difference in putting in a telephone—

Q. We will say one of the metallic circuits. A. That, Mr. Worthington, would be affected, to a great extent by the distance of the nearest cable pole; but if you will take a distance from a cable pole terminal, I can give it to you.

Q. Take the same distance, and take it from a cable pole terminal, instead of from the exchange—a quarter of a mile and two miles. A. The difference between a quarter of a mile and two miles would be that the two miles would cost, I should say, about six times as much. The material, of course, would be eight times as much, but the labor would not increase in the same proportion.

Q. You have spoken of the lifetime of copper and steel wire exposed to the elements. Let me ask you about some other part of the equipment which comes within your department. What are the principal articles in use, in the first place, in overhead construction? A. The poles are one principal item, and the pole equipment, which consists of cross arms and pins and braces and insulators. Then, of course, on the pole, after it is equipped with these arms, etc., are placed the wires.

Q. Of what wood are your poles? A. Chestnut.

292 Q. What is the average lifetime of one of those poles? A. The life of the pole is about ten years. It varies from eight to twelve years.

Q. Why do you use chestnut? A. We consider it the best, both from a lasting point of view, and the strength we can obtain.

Q. Does your reply apply to the cross arms as well as to the pole proper? A. No, sir; we do not use chestnut for the cross arms. We use white pine cross arms.

Q. What is the lifetime of the cross arms, and why do you use pine? A. We use pine because it is lighter and lasts longer than almost any other material that can be used.

Q. How long will the cross arms last? A. About the life of the pole, about ten years.

Q. And as to the other parts of the equipment of a pole? A. There are the pole steps. They last longer than the pole, but are not worth taking out of the old pole and putting in the new pole. The cross arm braces will probably last last longer than the cross arms. We sometimes use them over a second time, and the glass insulators are generally used over. That is the only part that can be used again.

Q. As to the underground construction, have you any experience or knowledge upon which you can form a basis as to
293 how long the present style of conduit will endure? A. I don't think I have a very definite idea.

Q. Is it subject to any depreciation at all, so far as your observation goes, either from the wear and tear of the elements, or from any other causes? A. Very slight. The principal thing to take into consideration would be damage by other persons excavating in the streets, which, so far, we have had very little experience with, on account of the substantial manner in which it is laid.

Q. As to the underground cables? A. They are very much more liable to damage.

Q. What is the average lifetime of your underground copper wire in cables? A. I don't know that I can form an average based on the cables actually in the new conduits, because they have not been there long enough to form such an idea, but from an experience with all the cables we have used, in the old system and the new system together, I should say the life of the cable was from twelve to fifteen years.

Q. Can you tell us why it is that the copper wires in the cables will not last longer than that? A. The copper wires in the cables would last longer if the lead sheath of the cable would last, if the lead sheath were not injured by electrolysis. When that gives out, the wires are ruined by the insulation becoming impaired. So far as the copper wires themselves are concerned, they do not deteriorate very readily.

294 Q. Is the plant of the Company that comes within your department, subject to injury by disasters of any kind? A. Yes, sir; we are very liable to be injured by both sleet and heavy wind storms.

Q. How does that affect you? A. It affects us to the extent of breaking down the poles and wires very seriously. Sometimes the expense of a wind storm lasting a few hours would be from $10,000 to $15,000.

Q. You mentioned electrolysis a little while ago. To what extent does that inflict pecuniary damage upon the Company? A. In that case the electrolitic action damages the lead sheath of the cable, which allows the moisture to get in and ruins insulation. That necessitates, in the first place, a series of tests, to locate the trouble, and in the second place, drawing in a new cable in place of the damaged cable, which means cutting out all the subscribers on that cable for a certain length of time.

Q. Mr. Crenshaw, what information can you give us as to the care used by the defendant Company in restricting to the lowest reasonable limits, the cost of this underground construction? A. I think due care is used to get it down as cheaply as possible, consistent with getting good work. We get estimates on all material used, and we employ a good class of labor at low wages.

295 Q. Do you have anything to do with that? A. Yes, sir.

Q. Have you gone to other cities at any time, for the purpose of ascertaining how this work was done, and at what cost? A. I have. At different periods, before doing any large amount of underground work, I generally take a trip around to several cities to see what improvements they have made, or what new ideas they have, so as to add them to my ideas.

Q. What cities have you visited for that purpose, before doing underground work for the defendant Company? A. Philadelphia, New York, Brooklyn, Albany and Boston.

Q. Did your inquiries extend to the matter of cost? A. Yes, sir.

Q. How does the cost of such work here compare with that in these other cities? A. Per foot of duct, we are under them.

Q. How is it you are enabled to do it for a less cost here? A. I attribute it to being able to obtain both material and labor cheaper; and I think by doing the work by day's labor and giving it personal superintendence and direction, we also obtain both cheaper work and a better class of work.

Q. Do you use white labor or colored labor princi-
296 pally? A. Principally colored labor.

Q. Is that cheaper than white? A. It is cheaper, as far as I know, and better.

Q. You have told us that in this outside work, of which you have charge, you do that which comes both within the construction division and that which comes within the maintenance division? A. Yes, sir.

Q. Have you anything to do with determining the question of whether certain work shall be charged to maintenance or construction under your supervision? A. Yes, sir; through consultation with and direction of the General Manager.

Q. Then are you familiar with the rules which have obtained in that regard during the time you have been connected with the Company? A. Yes, sir.

Q. And especially since you have held your present position? A. Yes, sir.

Q. Please state what those rules are? How do you determine what shall be charged to maintenance and what shall be charged to construction? A. The charges to construction are in connection with work that adds to the plant of the Company, without having replaced former plant or anything that the Company at that time had.

Q. Do I understand that everything else is charged to
297 maintenance? A. Yes, sir.

Q. Explain more fully what you mean about replacing existing work and charging it to maintenance? A. If this Company had what we call the old solid system cables in a certain section of the city and replaced it with the new drawing-in system, if the expense of the new system did not exceed the cost of the old system, it was charged to maintenance.

Q. Suppose it did exceed the cost of the old system? A. If it did exceed it, the amount of excess was charged to construction.

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Crenshaw, what was the extent of the solid system, as you call it, at the time you commenced to replace it with the drawing-in system? A. It has been so long ago that I cannot tell, except very roughly. I should say about 30,000 feet.

Q. 30 thousand feet? A. Of conduit.

Q. Is that 30,000 feet of conduit? A. Conduit, yes, sir.

Q. When was it that you abandoned the solid system? A. We did not abandon it all at one time.

Q. I mean when was it you ceased to lay the solid system?
A. The last was laid in 1886; possibly a little in 1887.
298 Q. Is any of it in use now? A. No, sir.

Q. How many cables had you then in the conduits?

Mr. WORTHINGTON: When?

Q. At the time when you ceased to build it in 1886? A. At its maximum, do you refer to?

Q. Yes. A. As well as I can remember, there were 24.

Q. Explain what you mean there? A. In what way?

Q. Do you mean 24 cables only running from the exchange? A. Twenty-four cables running from the exchange.

Q. Can you give us the size of those cables in wires? A. 100 wires in each cable.

Q. They were single wires, I take it, at that time? A. Single wires.

Q. Did you have so many cables in all the conduits? How many cables had you in each conduit? A. I had 24 cables in all the conduits,—that is radiating in different directions from the exchange.

Q. Can you give us the length of feet of cables? A. No, sir. I could probably guess at it, but I cannot give it.

Q. Can you easily ascertain? A. I think possibly I
299 can.

Q. Are you prepared to state the cost to the Company of the solid system as it then existed? A. Only approximately.

Q. To what extent have you informed yourself of it? A. Only from being familiar with the work as it was being done, and being done under my direction, and having a record at the time of the cost of it.

Q. Is that record available to you now? A. That is what I am not certain of. I think possibly it is.

Mr. BIRNEY: I would like Mr. Crenshaw to inform us upon both those points—the length in number of feet of the cable in the solid system, and the cost.

By Mr. BIRNEY:

Q. Have you given us the present length of the conduits? A. Which conduit?

Q. Of all the conduits of the Company. A. At what time?

Q. Now. A. I have given that—15.01 miles.

Q. And 132 miles of duct? A. Yes, sir.

Q. What part of that duct space is filled with cables? A. I think I can approximate that. About one-third.

Q. What proportion, in your judgment, will the cost of putting in cables of the remaining two-thirds, bear to the cost already incurred for laying the conduit? A. I don't ex-
300 actly understand the question.

Q. What proportion, in your judgment, will the cost of putting in cables of the remaining two-thirds bear to the cost already incurred for laying the conduit and putting in the cable already in? A. It would depend very much on the size of the cable put in.

Q. What size cables does the Company ordinarily use? A. Both fifty pair and 100 pair cables.

Q. How do you determine whether to use the 100-pair cable or the 50-pair cable? A. It depends upon the amount of wires desired in a given direction.

Q. Do central parts of the city use the larger cable? A. Generally, though we have some 50-pair cable in the central portion of the city.

Q. Can you give us any rule by which you determine whether you will lay one or the other? A. The needs for the given number of wires.

Q. Can you tell how many 100-pair cables you have in use, and how many 50-pair cables? A. The cables all start out from the building as 100-pair cables. After getting out to certain points, half of it drops off, and the other half continues on as a 50-pair cable.

Q. Suppose a conduit already supplied to a third of its capacity with 50-pair cable, what will be the items of
301 cost to the Company to supply the other ducts in that conduit with cables? A. 50-pair or 100-pair?

Q. 50-pair. A. It would be about 35 cents a foot or about 400,000 feet.

Q. Where do you get your basis for measurements of 400,000 feet? A. There is approximately 400,000 feet of vacant duct.

Q. In the entire system? A. In the entire system.

Q. Then supposing a shorter distance, the cost would be 35 cents a foot for the cables? A. Approximately. On very short lengths, it would be more than that. Anything from 5,000 up it would about 35 cents a foot.

Q. What proportion would that cost bear to the expense of laying the conduit in which those ducts are found? A. The average cost per foot of duct is about 23.55 cents. The average cost of furnishing and drawing in this cable is about 35 cents. That is about the proportion.

Q. That is, including the cable itself, is it? A. The 35 cents includes the cable.

Q. When you took up the solid system and replaced it with the drawing-in system—

Mr. WORTHINGTON: I object to that question, because he has not said he took up the solid system. He said it
302 was abandoned in the ground.

By Mr. BIRNEY:

Q. When you abandoned the solid system and used the drawing-in system, did you increase the capacity of the system for business? A. As far as cables were concerned?

Q. Yes. A. I did not.

Q. Did you increase it as far as cable capacity was concerned? A. I did.

Q. To what extent? A. It varied in different sections of the city.

Q. Well, average it. A. I cannot average it until I get the length of duct in the solid system.

Q. Did the fact that the capacity of the system was thus increased induce any charge of part of the expense to the construction account? A. Yes, sir.

Q. What part was charged? A. I do not know. I would

have to look that up, too. I should say, roughly, about 60 per cent was charged to construction.

Q. And has that plan been pursued in recent years? A. It depends up on the amount of the solid system aban-
303 doned, and the amount of new work constructed to take its place. Where the cost of the new work did not exceed the original cost of the old work, it was all charged to maintenance. Where it did exceed it, the excess was charged to construction.

Q. So I understood from your answer in chief, and I construed your last answer to be opposed to that. Where the cable capacity of the conduit was increased, but the cost did not exceed the original cost of the solid system, did you charge any part of the new work to construction? A. I did not.

Q. Were the prices of labor and of material from 1878 to 1886—did you say 1886? A. 1886 or possibly 1887. I think 1886.

Q. Were greater or less than they have been in the last three or four years? A. The labor has been approximately the same. The classes of material used in the two systems are almost entirely different. Therefore it is very hard to compare the prices.

Q. In the solid system what wire was used, copper or steel? A. Copper.

Q. Did you do any work of construction during the year 1898? A. Very little. I doubt whether I did any. I do not recall any special instances.

304 Q. What was the extent of the work you did in 1897 in constructing conduits under the drawing-in system? A. I did not construct any. I replaced conduits.

Q. What do you mean by "replaced conduits?" A. Replaced an old system with a new system, abandoning the old system.

Q. In doing that, did you rebuild on the site of the former conduit? A. Only at certain points, and at those points, I chopped the old conduit out of the way.

Q. Then whether we call it, in your method of bookkeeping, construction, or maintenance, you did, in fact, make excavations and build conduits? A. Yes, sir.

Q. My question refers to that. What was the extent of the building—if you will use that word instead of construction—the building of conduits in 1897, in miles or feet, if you can give it? A. It was about 9,000 feet of conduit.

Q. What was the capacity in duct feet? A. It varied from one to eight.

Q. One to eight ducts? A. Yes.

Q. And aggregated about how much? A. I think about 50,000 to 55,000 feet of duct.

Q. Those conduits were dug and built to take the place in your system of working of the solid system, which was abandoned? A. They were dug and built by or alongside
305 of the solid system, to take the place of it.

Q. The actual work was all new, was it not? A. New to the extent that it was replacing the other conduits. We had to use the same amount of labor to dig this trench that we used to dig the other trench.

Q. You did not put it in the same place as the former one? A. We could not do that, possibly.

Q. Was any part of that charged to construction? A. No, sir.

Q. Did you do any work of that kind in 1896? A. I do not remember any large amount. Probably some small branches were replaced.

Q. Have you informed yourself of the cost of the work thus done in 1897? A. I knew at that time, and I know approximately now.

Q. Give it to us? A. About $20,000.

Mr. HEMPHILL: My recollection is that that amount was twenty odd thousand dollars.

A. Twenty thousand dollars or twenty-two thousand dollars. I have so many figures to keep in my head that I cannot remember everything exactly.

By Mr. BIRNEY:

Q. In the last several years, Mr. Crenshaw, have you had any unusual items of expense for maintenance? A. Yes,
306 sir.

Q. What were they, and what caused them? A. Last September, two years ago, we had a terrific windstorm, that cost us between $15,000 and $20,000 in repairing our lines.

Q. In this city alone, or in the whole system? A. In this city. We have had disastrous fires and sleet storms at different times. The fires have injured our cables as well as our overhead wires.

Q. What fire, disastrous in that regard, do you now recall? A. The one at the Power House was one. The Knox Express fire was quite a disastrous fire for us. I don't know whether that is included in recent years or not. That was some years ago; I don't remember just how long ago.

Q. When was the Power House fire? A. Last September, a year ago, I think—a little over a year ago.

Q. What expense did that fire entail upon you? A. I don't know. I didn't keep any separate record of the expense caused by that fire.

Q. Is there any other fire to which you can refer? Do you know what the Knox fire cost? A. No, sir; I do not.

Q. Is there any other of which you have knowledge? A. There is no other large fire that I know of in recent years. There was one in the Center Market here recently that did us some damage, but not a great deal.

307 Q. What other storms, if any, than the one of September, 1896, have caused any considerable loss to the Company? A. We have had several sleet storms in the past four or five years. I don't remember the dates. Of course it always occurs in the winter time.

Q. What was there in 1897 to cause unusual expenditure, if anything? A. In the way of fires or sleet storms?

Q. Anything. A. There was a good deal of work done on the general repairs of the line in 1897. The Power House fire is the only fire I know of.

Q. Was that the only extraordinary incident? A. As far as fires are concerned, it was.

Q. As far as anything was concerned. If there was anything else, please state it? A. There were slight sleet storms, but not severe enough to make a great impression—nothing that would require my entire force to work four or five days in repairing.

Q. Sleet storms affect the overhead system, I understand? A. Yes, sir; the overhead system.

Q. Did you form an estimate of the extent of cost to the Company, occasioned by the storm of September, 1896? A. I kept track of the approximate expense; yes.

Q. What was it? A. As well as I remember, about

308 $15,000.

Q. That was an unusual item? A. Very unusual. It was the biggest storm we have had in my experience.

Q. Mr. Crenshaw, you have referred to electrolysis as a source of loss. Is it not easy for the Company now to protect itself against electrolysis? A. No, sir; I don't know that it is easy. We think that we can, by spending a good real of money and time, reduce it to a minimum; but we do not know that we can cure it by any manner of means.

Q. What are you doing to protect the underground system from electrolysis? A. Running heavy copper return wires through the ducts to the power house at which we think we are being damaged.

Q. Is it not believed among scientific men that that will prevent electrolysis? A. As far as I know, it is believed among scientific men that it reduces it to a minimum.

Q. When did you begin that system? A. What system?

Q. Of laying return copper wires.

Mr. WORTHINGTON: To prevent electrolysis?

Q. To prevent electrolysis.

A. My impression is in 1896.

Q. Can you state how long it takes electrolysis to so affect a cable as to destroy its usefulness? A. It depends up-
309 on the amount of the electrolysis. I will state that we make an examination of our cables in the manholes, about every two months for that special purpose. We have, since having our cables connected up with this return wire had cases of electrolysis, when the cable has been so damaged that it has had to be withdrawn and a new piece put in place of it.

Q. Has that occurred in cables protected from the time they were laid by the return copper wires? A. Supposed to be protected. The Electrician of the Company makes the necessary test to locate the flow of the current, and recommends what should be done towards curing it. I carry out the recommendation.

Q. Can you state to what extent you have suffered from electrolysis in the last few years in new cables laid in that time and guarded by the copper return wires? A. New cables laid within the last two years?

Q. Yes; and guarded by the copper wires. A. I only know of one case where 200 wires were destroyed. There are other cases that I know of where the cables were badly pitted, but were not entirely destroyed.

Q. What was the cost of repairing the damage done by electrolysis to the 200 wires you speak of? A. Leaving out the inconvenience to our subscribers, the damage was probably about $800.

Q. Where was that? A. At 13th and G streets.

310 Q. That is the only pronounced instance you know? A. No, sir.

Q. Where was another? A. You asked me in connection with cables laid within the last two years?

Q. Yes. A. We have had other cases of electrolysis. One was at Fifth and G streets.

Q. That occurred more than two years ago? A. No; it occurred within the past two years, but the cable was laid more than two years ago.

Q. When were the return wires put in to guard it, if at all? A. In 1896, we began, as I recollect, and we only recently, within the past two weeks, put in a return wire.

Q. Was that particular cable of which you have just spoken guarded by return wires? A. That particular cable was included in the general system of return wires.

Q. In the same manner in which you have guarded new cables laid? A. In exactly the same manner, sir.

Q. Is there any other case known to you? A. Not where the cable has been entirely destroyed. There are other cases known to me where the cable has been damaged.

Q. In the two cases mentioned, did you ascertain how it was that the wires had failed to protect the cable? A.
311 Wires?

Q. Yes; the return wires. A. Simply that there was a current there that we had no means of knowing anything about until the damage was done.

Q. What was the cost of repairing in the second case you have mentioned? A. In the second case the cost was about $600.

Q. Do you know the amount paid by the company for the poles it uses in its overhead system? A. Yes, sir; approximately. The amount varies on poles gotten at different times.

Q. What is paid now? A. From $2 up to $44.

Q. For what kind of poles do you pay $44? A. Chestnut—all chestnut.

Q. Delivered on the ground? A. Yes, sir.

Q. And for what kind do you pay $2? A. That is for the short poles, about 20 or 25 foot poles.

Q. What is the height of the chestnut poles you speak of as costing $44? A. 80 and 85 feet.

Q. What is the proportion of those expensive poles to the whole number that you have? A. That is a very hard question to answer. If I am building a line on the outskirts of
312 the city or on a country road, they are short poles. If I am setting them within the city limits, near the heart of the city, they are almost all long poles. We use, however, very few of the 25 foot poles, and also very few of the 80 and 85 foot poles.

Q. What is the length ordinarily used? A. The lengths most frequently used are from 55 to 70 foot poles.

Q. They are chestnut, are they? A. Chestnut.

Q. What do they cost? A. They vary according to length, and according to the contractors furnishing them. A 55 foot pole will vary from $8 to $12 a pole.

Q. And the 70 foot pole. A. A 70 foot pole will vary from $18 to $26 a pole.

Q. Are these prices for the poles laid on the ground or erected? A. Laid on the ground, in what we call the pole yard, as a rule.

Q. They are put in by the company's own workmen? A. Yes, sir. That is just the pole and the rough bark, with the limbs trimmed off, as it is hauled out of the woods.

Q. What do the cross arms cost you? A. What sizes? We have different sizes.

Q. Do they vary in size? I suppose they do? A. Yes,
313 sir; they vary from a two-pin arm to a ten-pin arm.

Q. What do the various sizes of the cross-arms cost

you? A. The two-pin arm which we very seldom use costs about 12 cents.

Q. Twelve cents each? A. Each; that is without its equipment, pins, glasses, &c. A six-pin arm costs about 30 cents, and a ten-pin arm about 42 cents. That is, in all cases, unpainted.

Q. What do insulators cost you? A. We have different prices for insulators. We have porcelain insulators and two sizes of glass insulators.

Q. Give us the cost of each? A. The porcelain insulator costs about half a cent; somewhere between half and three-quarters. I am not very certain of the exact price. What is called the pony glass insulator, which we very seldom use now, costs about one and one-eighth cents. The standard glass insulator, that we do use as a rule, costs about two and a quarter cents.

Q. Do you know how many poles are employed in the city of Washington? A. Yes, sir; I think I can give it to you. About 1,400 within the city limits.

Q. Now I will ask you as to the District; how many in the District? A. I can only approximate that. In the Dis-
314 trict outside of the city there are about 900.

Q. Are you in charge also of the same kind of work in any other part of the territory of the Chesapeake & Potomac Telephone Company? A. I think I stated that I was in charge of the same class of work all through this company's territory.

Q. What are the systems in use in the cities, other than in Baltimore, where the company has central exchanges? A. Do you refer to the cities in this territory?

Q. Yes. A. I don't know that I know exactly what you mean by a "system."

Q. Have you overhead or underground systems? A. Overhead, with the exception that in Hagerstown we have a very little underground.

Q. In Cumberland, Westminster and Martinsburg the systems are overhead entirely? A. Entirely.

Q. And in Hagerstown almost entirely so? A. Almost entirely.

At the suggestion of counsel for complainants, they having other engagements for Friday and Saturday of this week, the further taking of these depositions was thereupon adjourned until Monday next, November 28th, 1898, at 3:20 o'clock p. m.

315 WASHINGTON, D. C., November 29, 1898, 4 o'clock p. m.

Met by agreement, the appointment for the 28th of November, having been passed by consent.

Present on behalf of the complainants, Mr. Birney, Mr. Hemphill and Mr. Peter.

Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

Testimony of A. P. CRENSHAW, continued.

By Mr. WORTHINGTON:

Q. Mr. Crenshaw, you were requested at the last session by counsel for complainants to produce a statement of length of cables in the old, underground, solid system of the defendant company, and the cost thereof; have you that statement? A. I can get it.

Q. What is it? A. The length of cable is 110,125½ feet; length of conduit, 30,513 feet; total cost, including repairs of certain defects in the plant, $114,236.15.

Q. I understand that that refers to what you have denominated as the solid system of underground conduits, which was abandoned? A. Yes, sir.

Q. You are also requested by counsel for complainants to give a statement as to that part of the expense of replacing the solid system with the drawing-in system, which was
316 charged to the construction account; have you that? A. The entire cost of the drawing-in system, laid in 1897, $21,398.35 was charged to maintenance on account of replacing a portion of the solid system, cables and conduits.

Cross-examination continued.

By Mr. HEMPHILL:

Q. Mr. Crenshaw, state the extent of the overhead metallic circuit wires in this District at this time. A. Miles of wire?

Q. Yes. A. I think I made that statement; I can give it to you again: 1,406 miles.

Q. What causes the destruction of copper wire and the other wires, aside from storms? A. There are a great many causes; trees breaking down will destroy them; windstorms, fires, sleet storms, and general breaks from limbs of trees falling over and poles falling down.

Q. Does copper wire suffer from corrosion or rust? A. Not to any great extent.

Q. Does it suffer at all? A. Yes; slightly.

Q. What is the average life of batteries that you use in the telephone business? A. In my department we don't use any.

Q. Then you cannot answer that? A. I cannot answer it.

Q. Do you know what batteries cost? A. I do not.

317 Q. You produced defendant's exhibit No. 9, setting forth the requisition that you made for one month's requirements of your department in 1898; is that an average of the amounts that you called for to be supplied with? A. I do not know that it is; not necessarily.

Q. Do you not mean to say then that that exhibits more than the class of goods you called for? A. It exhibits the class of goods I called for in that special month.

Q. Is that an average of the amount of goods you called for? A. No, not necessarily; it is not made as an average; the average varies according to the necessities and condition of the stock.

Q. Can you give us a statement of the number of men you have employed in your department for six years back? A. Only approximately.

Q. State what it is, as nearly as you can. A. It varies every year, but the maximum I should say would be about 150 men.

Q. What I am trying to get at is the number you have employed each year during that time. A. The same variation would apply to almost any year, because when I am doing underground conduit work, for instance, I nearly treble my regular force; therefore I could give no exact statement that
318 would be an average for each year.

Q. Is there any way that you can average it? A. By going over the pay rolls I possibly could.

Q. That would not be much trouble. A. That is more in the Auditor's Department than it is in mine, however.

Q. I do not ask for that now; I will do that later if we find it necessary. You stated the cost of the solid conduits, including certain repairs; what repairs are those? A. I made the statement that the solid system, including certain improvements, amounted to $114,236.15. To go into more detail I will explain that of that amount $95,224.05 was spent and charged to construction covering brand new work; $18,000 of this was spent in improving the form of conduit from that originally laid, so as to make it a better conduit, and was charged to reconstruction.

By Mr. WORTHINGTON:

Q. You mean $18,000? A. Of the $114,236.15. The other $1,210 was for maintaining branch lines.

By Mr. HEMPHILL:

Q. What improvement did you make that cost the $18,000 and odd? A. That was caused by changing the system of tar in a portion of the conduit, and wood in the other portion, to asphalt. When we first laid that conduit we did not use the asphalt prism, but used in one instance a box full of
319 hard tar, and in other instances we simply used a wooden shield, a V-shaped piece of wood, to protect it.

Q. What was the average cost per foot of that conduit? A. $3.12, that is, the construction portion; we made that by dividing the $95,224.05 by the 30,513 feet.

Q. Have you divided it into the $18,000 and the $95,224.05, too? A. No, sir; because that was not charged to construction.

Q. That was charged to maintenance? A. To maintenance.

Q. The $18,000? A. The $18,000 and the $1,210.

Q. What has been the average cost per foot of conduit for the drawing-in system with the cable in it? A. I guess I can give you that by taking the total number of feet of conduit and dividing it. (After making calculation.) $2.75½ per foot.

Q. You add in these conduits a large amount of extra space for cables to be drawn in as they are needed? A. Yes; you might say a large amount.

Q. About two-thirds of the total, is it not? A. About.

Q. You stated, Mr. Crenshaw, in your former examination, that when you got the extent of the solid system you would be able to state what increase in cable capacity there was in the drawing-in system over the solid system; can you give us
320 that now? A. I will have to ask just what that refers to.

Q. It refers to the question you were asked as to when you abandoned the solid system, and used the drawing-in system, whether that increased the cable capacity, and if so, to what extent? A. Then you refer to the work done in 1897?

Q. Oh, no; to all the work done in putting in the drawing-in system in place of the solid system. A. The only work done when we abandoned the solid system was the work done in 1897; therefore the proportionate increase in that division was two-thirds; the cable capacity was two-thirds more than the cable capacity of the solid system, at an expense of about $6,000 less.

By Mr. BIRNEY:

Q. Please give us the extent of the conduit building in 1897, to which you refer. A. In 1897 we replaced 9,045 feet of asphalt conduit, including the cables therein, with a drawing-in system, the latter costing $21,398.85; the system replaced costing $28,226.40, or $6,821.55 more than the cost of replacing.

Q. The increased cable capacity then, as I understand you, in that work of substitution, was about 18,000 feet of cable? A. I did not say so.

Q. Then what was the increased capacity? A. I say it was two-thirds more than the cable capacity in the old system.

Q. What do you mean by two-thirds more? You have
321 given us the number of feet of solid system, which you abandoned in 1897; now give us the capacity of cable feet of the drawing-in system, which was used to replace the solid system. A. Do you want the cost?

Q. I ask you now the cable capacity of the new work. A. As near as I can give it, as I stated before, it was 50,000 feet.

By Mr. HEMPHILL:

Q. You did not replace any of the solid system by the drawing-in system, except in 1897? A. No, sir; not directly.

Q. Had you abandoned any of the solid system prior to that? A. We had.

Q. In what years did you first lay it? A. It began in 1884.

Q. And continued up to what time? A. Up to 1888.

Q. When did you begin to abandon it? A. About 1894.

Q. And you finally quit using it when? A. In 1897.

Q. You have stated that you charged 60 per cent of the cost of putting in the drawing-in system to construction; does that refer to work done in 1897? A. That referred roughly
322 to the entire work.

Q. On what theory did you charge 60 per cent to construction? A. I told you that that was as near as I could give it at the time, and I have told you to-day exactly the portion I had charged to construction. That is replaced by the figures I have given you to-day.

Q. The balance of it was charged to maintenance—or what? A. Balance of what?

Q. Of this amount for putting in the drawing-in system in 1897. A. I stated the exact amount that was charged to maintenance.

Q. When did you commence the drawing-in system? A. In 1891.

Q. Have you done much construction since 1892? A. In what way?

Q. In your department. A. Underground or overhead.

Q. Either. A. Yes; we have done right smart.

Q. How much, and in what years? A. Since when?

Q. Since 1892. A. In 1893 we did a little over $9,000 of underground construction; in 1894 we did about $25,000 of underground construction; in 1896 we did about $5,500 under-
323 ground construction. That is all that I have any record of.

Q. Have you stated the reason why you abandoned the solid system here? A. I have.

Q. To what account is the inside work of the telephone system charged? A. That is not in my department, and I do not know that I am competent to answer.

Redirect examination.

By Mr. WORTHINGTON:

Q. With reference to the increased amount expended for maintenance in 1897, do you remember anything that occurred

during that year which accounts for that increase? A. Of course that was accounted for partially by expending $21,398.95 in replacing some of the solid system cables; but a very large amount of that was accounted for by the fact that up to 1897 we were very much limited by Congress and the Commissioners as to repairing or fixing up our poles and wires. In the year 1897 Congress granted us authority to make certain repairs; and, the lines having gotten into very bad condition, we of course proceeded to make all the repairs we considered necessary.

Q. Is the act of Congress to which you have referred that paragraph in the District Appropriation Bill which was approved March 3, 1897, which is in the following words:

324 "*Provided*, That wherever there are telegraph or telephone poles, or telephone conduits, available for the use of the said Fire Alarm Telegraph, the Commissioners of the District of Columbia are hereby authorized to make arrangements for the use of such poles or conduits without expense to the said District; and the authority granted to the said Commissioners in the District of Columbia Appropriation Act, approved August 7th, 1894, to authorize the erection and use of telephone poles in the alleys of the City of Washington, shall be limited as follows: Hereafter no wire shall be strung on any alley pole at a height of less than fifty feet from the ground at the point of attachment to said pole; temporary permits may be granted by said Commissioners to string wires from cable poles, or from existing overhead trunk lines, to poles in, or to be erected in, alleys and from alley poles in one square to alley poles, or house top fixtures, in another square, for the purpose of making necessary house connections from all cable poles and existing overhead trunk lines within the District of Columbia; such house connection to be made from the cable poles or overhead trunk lines nearest the subscriber." A. That is the legislation I referred to, the company not knowing up to the time that that was passed as to what clause would be put in, and there being at least a possibility of there being a clause put in making us take down some of our lines, and therefore we did not want to unnecessarily expend money in rebuilding them until we had the right to do so.

Q. For how many years prior to the enactment of the

325 provision which I have just read had you been withholding your repairs awaiting for some such authority? A. For about three years.

Q. In what you have stated as to the cost of telephone poles, have you included the cost of shaving them and setting them up, or just the first cost of the poles? A. That is the cost of the pole with the bark and limbs chopped off, and delivered by the contractor at the company's pole yard.

Recross examination.

By Mr. BIRNEY:

Q. You say that you had been waiting for about three years for authority to make these repairs. Before that time did you keep your system in good repair? A. Average repair, yes.

Q. In what year did you begin to let it get out of repair? A. About 1894. We did not exactly let it get out of repair, but we did not do any more than was absolutely necessary to maintain it.

Q. After that did you do what was unnecessary in maintaining it? A. No; we put it in what we called good repair.

Q. Have you any knowledge of the cost of maintenance prior to 1894? A. In dollars and cents, do you mean?

Q. In dollars and cents. A. No, sir. I do not keep
326 the books in my office.

Q. Where have you obtained the figures which you have given us in the course of your testimony? A. From my records, together with the assistance of the auditor.

Q. What records do you keep? A. The bills for materials pass through my department, and I take note of them in that way.

Q. As to that I can understand how the bills would give you light; but in testifying with reference to the extent of the work, the number of poles and the like, where have you obtained your information? A. I got it from my foremen's reports in my department.

Q. You obtained that, then, from your own records? A. I obtained that from my own records.

A. P. CRENSHAW.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

SAMUEL M. BRYAN, recalled for further cross-examination.

By Mr. WORTHINGTON:

Q. Have you produced a statement giving the information called for by counsel for complainants as to the number of metallic circuit stations and grounded stations respectively,
327 in the Baltimore Exchange June 30, 1898, and the same information as to October 31, 1898? A. Yes.

Witness here produces the statement referred to, which is marked by the examiner for identification, "Identification Ex. No. 1," and the same is handed by counsel for the defendant to counsel for complainants. The said statement is in the words and figures following, to wit:

BALTIMORE EXCHANGE, June 30th, 1898.

Number of metallic circuit stations.....2,057 (60 per cent)
" " grounded " " .....1,381 (40 per cent)

October 31st, 1898.

Number of metallic circuit stations.....2,234 (62 1-3 per cent)
" " grounded " " .....1,352 37 2-3 per cent)

Q. Have you also prepared a statement giving the information called for by counsel for complainants as to the number of metallic circuits and grounded circuits, and the number of subscribers on a line, in the exchanges in Cumberland, Westminster, Hagerstown, and Martinsburg? A. I have.

Witness produces the statement referred to, which is marked by the examiner for identification "Identification Ex. 328 No. 28," and the same is handed by counsel for the defendant to counsel for complainants. The said statement is in the words and figures following, to wit:

Cumberland, including sub-exchanges of Frostburg and Lonaconing, October 31st, 1898:

Number of metallic circuit stations..... 171
" " grounded " " 9

Rates for service in dollars.

	Metallic Circuit.		Grounded Circuit.	
	Business.	Residence.	Business.	Residence.
1 Party on a line.....	72	60	48	42
2 Parties on a line.....	60	48	42	36
3 Parties on a line.....	48	36	36	30
4 Parties on a line.....	36	30	.....	.....

Westminster, October 31st, 1898:

Number of metallic circuit stations..... 43
" " grounded " " 3

Rates for service in dollars.

	Metallic Circuit.		Grounded Circuit.	
	Business.	Residence.	Business.	Residence.
1 Party on a line.....	72	60	36	30
2 Parties on a line.....	60	48	30	24
3 Parties on a line.....	48	36	24	18
4 Parties on a line.....	36	30	.....	.....
6 Parties on a line.....	24	18	.....	.....

329 **Hagerstown, October 31st, 1898:**

Number of metallic circuit stations..... 54
" " grounded " " 5

Rates for service in dollars.

	Metallic Circuit.		Grounded Circuit.	
	Business.	Residence.	Business.	Residence.
1 Party on a line.....	72	60	36	30
2 Parties on a line.....	60	48	30	24
3 Parties on a line.....	48	36	24	18
4 Parties on a line.....	36	30	.....	.....
6 Parties on a line.....	24	18	.....	.....

Martinsburg, October 31st, 1898:

Number of metallic circuit stations..... 9
" " grounded " " 30

Rates for service in dollars.

	Metallic Circuit.		Grounded Circuit.	
	Business.	Residence.	Business.	Residence.
1 Party on a line.....	72	60	36	30
2 Parties on a line.....	60	48	30	24
3 Parties on a line.....	48	36	24	18
4 Parties on a line	36	30	.....	.....

Q. Have you also, as requested by counsel for complainants, prepared a statement showing for each year separately from 1884 to 1897, the number of switchboard operators in the Washington Exchange, the total charge to operating salaries
330 and wages, the amount charged to rent, light and heat, the amount charged to incidental operating expenses, and the total operating expenses? A. I have prepared that statement, except that for the years 1884 to 1890 inclusive, no statement is made under the headings of "Total Charge to Operating Salaries and Wages; Rent, Light and Heat, and Incidental Expenses."

The witness here produces the statement referred to, which is marked by the examiner for identification "Identification Ex. No. 3," and the same is handed by counsel for the defendant to counsel for complainants. The same is in the words and figures following, to wit:

MEMORANDA REGARDING SALARIES AT WASHINGTON EXCHANGE OF THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.

	No. of Washington switchboard operators.	Total charge to operating salaries and wages.	Rent, light and heat.	Incidental.	Total operating expenses.
1884	19				$7,980.92
1885	18				9,963.91
1886	18				9,572.72
1887	19				9,248.98
1888	22				11,369.76
1889	22				12,310.51
1890	28				14,000.55
1891	29	$12,551.64	$1,523.17	$578.40	14,653.21
1892	32	13,035.59	2,596.13	605.35	16,237.07
1893	30	13,814.61	2,639.26	697.21	17,151.08
331					
1894	30	13,723.79	2,199.45	739.28	16,662.42
895	30	13,490.60	2,254.58	511.91	16,257.09
1896	30	13,952.34	2,340.22	355.74	15,648.30
1897	35	14,213.40	2,332.70	519.55	17,065.65

NOTE:—In addition to the switchboard operators, there are a number of employees engaged in other work in connection with operating the service, and while it is not practicable, for want of time, to give the number, or to segregate the amount of salaries and wages paid them from the salaries and wages paid the switchboard operators, the total amount charged to operating expenses is given above, for each year from 1884 to 1897, inclusive; and these totals are divided into "Salaries and Wages," "Rent, Light and Heat," and "Incidental" for the years 1891 to 1897, both inclusive.

November 26th, 1898.

Q. Why is it, Mr. Bryan, that in this last statement marked "Identification Ex. No. 3," in the years 1884 to 1890, a part of the information called for is not given? A. It is omitted for the reason that, as I am informed by the Auditing Department, it would require several weeks to obtain it by an examination of the weekly pay rolls for those years. The reason it can be given for the years 1891 to the present time is because in 1891 we began, for the first time, to put, in the shape of an annual statement, the details that are here called for, and which, prior to that time we had not put into the form of a statement.

By Mr. BIRNEY:

332 Q. Does this statement, indentification Ex. No. 3, contain a full statement of the items which it professes to cover? A. It is a true statement.

Q. As it has not been offered in evidence by your counsel

please state the number of operators, the amount of wages paid the operating force, and the other operating expenses, from 1884 down to the present time, each ear. A. This contains exactly what it purports to contain, nothing more.

Q. Then you adopt, as your answer, as I understand you, the statement contained in that paper? A. I do.

So much of the paper heretofore marked "Identification Ex. No. 3" as contains the figures, is offered in evidence by counsel for complainants; counsel for defendant offer in evidence the remainder of said paper, waiving their rights to insist that the whole paper should be offered by counsel for complainants, or none of it; and said paper is filed herewith, Marked "Ex. No. 11." (See page 155.)

Q. Was the rate of wages paid your operating force increased or decreased between 1884 and 1891? A. I think there has been an inclination upward in the rates paid to operators since 1884, but I have not the exact figures.

Q. What wages are paid the operators at the switchboard?

A. The details of that are within the knowledge of the

333 Chief Operator more clearly than within my own, and I would have to get the information at second hand if I got it.

Q. Are they not within your own knowledge? A. They are not within my own knowledge without inquiry.

Q. As General Manager have you not the information? A. I do not keep those details on my desk after having once assisted in their adjustment.

Q. Do you not keep them in your mind? A. I do not.

Q. Do the salaries of any persons enter into the items under the head of "Total Charge to Operating Salaries and Wages," other than those paid the switchboard operators? A. There are others.

Q. Who are they, and in what place do they appear? A. I take it that the canvassers are included, but I am not posted now, as to whether the man who looks after the switchboard is on that roll or not; but that is a matter that would have to come from the Auditing Department, and I cannot answer wihout further inquiry.

Q. What do you pay the convassers, and how many of them are there? A. Some of the canvassers have been paid by commission and some by salary; I do not carry in my mind the rate at which they are paid.

334 Q. Do you know how many of them there are? A. I have just returned to Washington, and do not know now whether there are any canvassers on the roll or not; there were in 1897.

Q. How many? A. Two or three, possibly four.

Q. You do not recall what they were paid? A. I do not.

Q. Or how, whether by salaries or commission? A. I cannot speak with definiteness on that point.

Q. Are there any other employes than the canvassers, and perhaps the man at the switchboard? A. I do not now know what that distribution is, as to charges to that account, and would have to obtain the information from the auditing department.

Q. Then, so far as this note at the foot of "Ex. No. 11" is concerned, you have no personal knowledge? A. I have no personal knowledge except so far as relates to my reliance upon the books and accounts of the Company, of which that is a transcript.

Q. This note does not deal with the books or the accounts. Please look at the note, and say what is the extent of your knowledge as to what it contains? A. The information upon which this note is based is precisely the same character as the information upon which the entire answer is based.

Q. Do you know if any operators numbered in that list are exclusively devoted to long distance work? A. I do not know whether they are devoted exclusively to long distance
335 work, and I have no knowledge of any operator at present being devoted to that work. I would have to obtain that information at second hand.

Q. When a person is employed in the operating room are you first consulted? A. I am.

Q. Do you not fix the amount of pay? A. The amount of pay is fixed after consulting with the chief operator as regards the classes of operators, not as to each individual operator, the operating force being divided into classes at different rates of pay.

Q. How are those classes designated? A. We have no designation for them except that if one class should be paid $5 per week, we would designate that class as the $5 class, and if any other rate of pay was given we would designate the class by the amount of pay received. The matter of final settlement of these different classes of operators is left with the Board of Directors.

Q. Are you now prepared to state the number of metallic circuit stations and grounded circuit stations respectively in use by your Company at the Baltimore Exchange on June 30, 1898? A. (Witness reads from the paper heretofore produced and marked "Identification Ex. No. 1.") The number of metallic circuit stations on June 30, 1898, in Baltimore was 2,057; grounded circuit, 1381.

Q. What were the numbers on October 31, 1898? A. On October 31, 1898, the number of metallic circuit stations
336 in Baltimore was 2234, and the number of grounded circuit stations was 1352.

Q. I also asked you to furnish the number of telephones of the different kinds in use at your exchanges in Cumberland, Westminster, Hagerstown and Martinsburg, on October 31, 1898. Does this paper marked "Identification Ex. No. 2" contain your answer to that inquiry? A. Yes.

Said paper, heretofore marked "Identification Ex. No. 2" is offered in evidence by complainants' counsel, and the same is filed herewith, marked "Ex. No. 12." (See page 153.)

Q. Does your Company purchase its telephone instruments or lease them? A. It leases them.

Q. From whom? A. From the American Bell Telephone Company.

Q. And what does it pay per annum for each instrument, Mr. Bryan? A. It pays a different rate, according to the use to which the instrument is to be applied.

Q. Will you give us the classes of telephones, and rates of rentals?

Counsel for defendant state that witness is unable at this moment to give the information here called for, but will produce a statement in full answer to the question at an early date.

337 Q. Do you find, in your experience that as your subscriber becomes more and more familiar with the use of the telephone in his place of business or residence, he uses it more? A. Yes; that is the invariable result.

Q. Have you ever determined about what that increase is? A. No, sir; I do not think it would be practicable to determine that without a very great deal of labor.

Q. Have you kept no record of subscribers who have increased their number of calls? A. I do not know that we have, but the chief operator may have a record of that kind.

By Mr. HEMPHILL:

Q. What do you mean by switchboard station? A. I mean by that the position of the operator which requires a full telephonic equipment, an equipment by which she can listen for a call coming in, answer it, and connect the calling subscriber with the subscriber called.

Q. Does each operator have a switchboard station? A. Each operator has a switchboard station.

Q. Can you give us the cost of establishing the telephones in a house, its connection with the outside wires, etc. A. I cannot.

Q. Is Mr. John A. Tompkins, of Baltimore or Maryland, a public accountant in any way? If so, how was he ap-
338 pointed? A. I am informed that he is a public accountant.

Q. How are you informed of that? A. For the reason that his services are frequently availed of by railroad corporations, consolidation syndicates, and other parties who desire to have old accounts closed, and new ones opened.

Q. He has not any legal appointments or status, of any sort under any law, has he, so far as you know? A. I do not know whether or not in Maryland there is a law regulating that. A man may be a public accountant, however, without being licensed by law.

Q. If I recollect correctly, you testified formerly before the House Committee, that when the Chesapeake & Potomac Telephone Company bought out its predecessor it had about 40 per cent of the business that the Chesapeake & Potomac Telephone Company now has; is that correct? A. I do not recall now what my testimony upon that point was. Whatever it was at the time was based upon information obtained, but which I do not now carry in mind.

Q. I will refer hereafter to the printed page of the testimony. Has this company any regular charter issued by the District authorities under the laws of the District of Columbia? A. I think not.

Q. Has it any franchise granted by Congress? A. No; not in the shape of a franchise.

By Mr. BIRNEY:

Q. Since the passage of the act of Congress of June 30,
339 1898, has your company made any effort to obtain new business at the rates fixed by that act of Congress? A. Not that I am aware of.

SAM'L M. BRYAN.

Subscribed and sworn to before me this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

JOSEPH EDWIN CRANDALL, a witness of lawful age, called by and on behalf of the defendant, having been first duly sworn, is examined,

By Mr. WORTHINGTON:

Q. What is your age? A. Forty.

Q. Your residence? A. Washington, D. C.

Q. Your occupation? A. I am an electrician and superintendent of equipment of the Chesapeake & Potomac Telephone Co.

Q. How long have you held those positions? A. One of them since 1884, and the other one since 1886.

Q. Which one since 1884? A. Electrician.

Q. In a general way, what are the duties of your office as electrician? A. To make such electrical tests of material to determine its quality as to its fitness for the service for
340 which it is intended; to test apparatus that is in use, and apparatus that is to be put into use; to determine the electrical conditions of the Company's plant, such as cable or any other electrical tests in a general way of the material or supplies, either in stock or in use.

Q. In a general way what are the duties of your position as superintendent of equipment? A. To make necessary recommendations for the material that is to be used in the company's plant; to personally direct the force that has to do with the placing of the equipment and the maintenance of the same; to oversee the work of the inspectors; to make monthly reports of material used; to make requisitions for all materials necessary for the equipment of the plant; to make estimates of material required for the installations of service of all kinds, either switchboard or subscribers' equipment; and to make reports upon the cost of installations, either in the shape of building switchboards or putting in the plants in outside office buildings or in the Company's building.

Q. Where is the line drawn between the Department over which you preside as superintendent of equipment, and that which comes within Mr. Crenshaw's duties? A. At the Exchange end, the superintendent of construction stops in his work in the basement on the main distributing frame; that is the point where the outside lines or cables enter; he represents one side of that distributing frame. At the subscriber's end my work begins, at the block which is fastened on
341 the outside of the building at the window.

Q. Then, in brief, you have the inside work and he has the outside? A. Yes, sir.

Q. What compensation do you receive? A. I receive $2100 per annum.

Q. How long has that been your salary? A. Since the week ending June 24, 1898.

Q. What was your salary before that? A. $1800.

Q. Does the salary of which you speak cover your duties in the performance of the duties of both offices which you fill? A. Yes, sir.

Q. Over what territory do you perform the duties of which you have spoken? A. The entire territory that the Company operates.

Q. My questions, unless otherwise specified, will relate solely to matters in the District of Columbia. A. Yes, sir.

Q. I wish you would tell what course is pursued when any material is required for the operations of the Company, with-

in the Department of which you have charge as superintendent of equipment. A. Do you mean generally?

Q. Yes, generally; not in detail. A. I mean in the regular connection of subscriber's equipment or any special installation.

342 Q. Both; give first one, and then the other. A. In the case of equipment for a subscriber's station, that is drawn on a requisition made upon the storekeeper, our plan being, as nearly as we can, to draw material for each individual job that is handled during the day; there may be one job or twenty jobs. Temporary receipts are given for that particular material. At the close of the day there is a statement made up of all the material that we have drawn on these temporary requisitions, and a permanent requisition is then made covering the entire amount of material used that day, stating for what purpose used, and the remainder of that material, which represents the material that has been drawn for work, is returned to the storekeeper; if it represents material that has been taken from the subscriber's place by reason of disconnection, that is also turned in to the storekeeper, for which he gives me a receipt showing that the material that I have been authorized to disconnect by duly issued sheet from the executive office, has been turned in to the Company's representative in charge of its supplies. In the event of there being a large installation required, such as a departmental switchboard, or a large commercial building to be wired, our first plan is to make an estimte, as nearly as we can, of the material required to do that work; that estimate is submitted to the General Manager for his approval.

Q. Have you brought here at my suggestion a copy of one of those estimates in order to show the form in which they are made, and the details upon which you go? A. Yes.

343 Witness produces copy of a communication dated October 14, 1898, addressed to the Chesapeake & Potomac Telephone Company, Mr. Arthur G. Fuller Acting General Manager.

The WITNESS: That represents the net cost.

Q. Does this show the form in which you make your estimates for submission to the General Manager? A. Yes, sir.

The paper referred to is offered in evidence by counsel for defendant, and is filed herewith marked "Defendants Ex. No. 13," and is in the words and figures following, *to wit:*

THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY,
No. 619 Fourteenth Street, N. W.

Washington, D. C., *October 14th*, 1898.

The Chesapeake and Potomac Telephone Company, Mr. Arthur G. Fuller, Acting General Manager, Washington, D. C.

Dear Sir:—I beg to hand you herewith an estimate of the cost of installing a 10-station, common battery, branch exchange system, in the United States Department of Justice, in this City:

50 foot of 20-pair cable, at 15c		$7.50
65 foot of 20-pair cable at 15c		9.75
1000 foot of No. 18 Okonite Wire (twisted) at 1½c		15.00
	C. B. Switchboard, 20 drop-present equipment 10	160.00
344	Battery rack, battery coils and bus-bars	53.00
	Miscellaneous material	5.00
Labor, 3 men, 5 days, at $2.25		33.75
		284.00
Superintendence		28.40
		312.40

Yours very respectfully,

Electrician and Superintendent of Equipment.

Q. What, if anything, do you have to do with the purchase of material, or the selection or purchase of material, for use by the Company, which goes into the hands of the storekeeper for distribution in the manner you have described? A. At the end of each month I make a list of materials required for the ensuing month; that is addressed to the purchasing agent. That material is based upon the material used in the preceding month, or in same cases to do work that we know we have got to do for that month. The purchasing agent takes that list of requirements, and from that makes up his list of purchases for my department during the month.

Q. Do you have anything to do with purchasing the materials? A. Not at all; no, sir.

Q. Or with the inspection of it when it is received?
345 A. Yes; I am expected to inspect the electrical material carefully, and, as most of it is furnished under specifications, to see that that material comes up to the specifications as to its quality; the quantity or prices I have nothing to do with.

Q. In the conduct of the business of which you have charge

will you tell us what, if anything, is purchased by the Company which is not required for the purpose of its work? A. Nothing, to my knowledge, sir.

Q. To what extent, so far as your knowledge goes, is what is purchased applied to the proper use of the Company and to no other purpose? A. The material is used entirely, so far as my knowledge goes, for the use of the Company. The entire purchases are used in that way.

Q. In the performance of your duties do you become acquainted with the prices of different classes of materials which come within your department? A. Yes.

Q. And the prices which are paid by the Company? A. Yes; largely. That comes from handling the same article so many times, so that I become more or less familiar with the prices. Q. What do you know as to whether or not articles which are purchased and which come within your province, are bought at the lowest market rates for articles of that kind?

Objected to by the counsel for complainants, because
346 it has not been shown that the witness has knowledge.

A. I have no personal knowledge that there are any rates higher than market rates paid.

Q. Who are the principal subordinates under you? A. I have three direct assistants in Washington.

Q. What are the names of the positions which they hold? How do you describe them? A. The chief inspector, the wire chief or test operator, and the clerk.

Q. Tell us whether or not they are necessary assistants, or whether they are employed and paid without proper justification? A. They are very necessary assistants.

Q. What compensation do they get? A. The chief inspector and the wire chief each receives $1200 per annum.

Q. And the clerk? A. $65 a month.

Q. What is your opinion as to the reasonableness of those salaries, from your knowledge of the men, and the duties they perform? A. I think they are very reasonably paid.

Q. How many employes have you in your department who come under your direction, aside from those three? A. The total force, including myself, is 24.

Q. How has it averaged for the last five or six years,
347 say? A. The average, I should think, has been about 20.

Q. And as to their compensation, what is that on the average? A. The average inspector's salary is about the general average throughout the country, $60 a month. We have a few special inspectors, one of whom receives $900 per annum. That is the extent of the high salaried men. We have a few at $2 per diem, and one or two at $1.50 per diem.

Q. What is your judgment as to whether you have any more

employes of the classes you have been describing, than are required to attend to the business of the Company? A. Frequently we have less than are needed and have to resort to night work.

Q. What is your judgment as to the compensation of these men? Do they get too much or not? A. No, sir; I think they are paid about on the average; if anything, a little under other places for the same kind of work.

Q. Without regard to other places, what is your judgment as to whether they get more or less than a proper compensation for the work they do? A. I think they get about the proper compensation.

Q. What are the names and uses of the principal parts of the telephone equipment which you put in a place of business or residence of an exchange subscriber? A. Princi-
348 pally the magneto bell and its combinations, backboard, battery and bell.

Q. What is the magneto bell? What part of the telephone that we are accustomed to see, is it? A. That is the machine with which the subscriber signals the central office.

Q. What do you call that part of the instrument which the subscriber puts to his ear when he wants to listen? A. That is the receiving instrument.

Q. What do you call that part of it that he talks with? A. The transmitting instrument.

Q. Describe in the same way the principal parts of the equipment in the exchange office here in Washington? A. The principal parts of the equipment of the switchboard are the drops, the answering spring jack, and the connecting or multiple spring jacks.

Q. Will you please describe what you call a switchboard, and these parts that you hve been enumerating, in such a way that one not familiar with the use of the telephone can form an idea as to the nature of the apparatus? A. Yes: first, the drop is the part of the equipment that is directly connected with the subscriber's line at the exchange end of his line; when he operates the magneto bell, by turning the generator, it causes the drop to fall by magnetic impulse. The answering jack, which is directly connected to that drop, forms the part of the apparatus that the operator plugs into to find what is wanted.

349 Q. So that the operator can talk to the subscriber; is that it? A. That puts in direct connection his drop with that of the same number of the answering jack; then he is asked what is wanted, and the multiple jack is the connecting link between him, and the party desired; that is connected up with the second or connecting plug, and cord.

Q. Who does that? A. The same operator who answers the original call.

Q. Suppose you have forty operators in an exchange; in front of how many of them does a wire from a subscriber run? A. Each operator answers her own allotted number of drops, from fifty to a hundred, but she is connected with, and can reach the entire capacity of the office—in front of her, to her left, and to her right.

Q. Do you mean to say that each operator can place any one of the subscribers within her bailiwick in communication with any other of the subscribers, no matter how many there may be? A. Yes.

Q. When a new subscriber is added to the Exchange, what is done in the operating room for the purpose of enabling each subscriber to connect with any other subscriber with whom he may want to talk? A. He is directly connected with his individual drop, and they are multiply connected through each position in the entire switchboard.

350 Q. If you have a new subscriber, in addition to say 2,200 subscribers already, how many connections do you have to make for him or that may be used by him? A. In our present equipment we have ten.

Q. What are they? A. His drop, the answering jack, and the eight multiple jacks in the other switchboards.

Q. Do I understand that these eight multiple jacks enable anyone of your telephone subscribers whom you already have to be put in communication with him? A. Yes, sir.

Q. Have you prepared a chart or charts illustrating the increase in the size and pieces of the switchboard as the number of subscribers increases in certain proportions? A. Yes, sir.

Q. Is this paper which I now show you one of those charts? A. Yes.

Q. Who prepared it? A. The draftsman with my assistant and myself.

Q. Under whose general direction? A. My direction.

Q. Was this prepared by yourself and your assistant? A. Yes.

Q. I observe that certain writing appears upon this, referring to the drawing upon it; who put the writing there? A. They are my statements.

Q. Typewritten in? A. Yes. sir.

351 Said chart referred to is offered in evidence by defendant's counsel, and the same is filed herewith marked "Defendant's Ex. No. 14."

Q. State whether or not that chart is a correct statement and exhibition of the results, so far as the switchboard is concerned, of increasing the number of subscribers from 2,200 to the different numbers which appear there in their proper places on the chart? A. It is, sir.

Q. Have you also prepared in the same way another chart,

illustrating in a different way the same manner? A. Yes, sir, except that it is made only on a 1,200 line basis.

Q. You mean beginning at 1,200 instead of 2,200? A. Yes, sir.

Q. Why did you take 1,200 in this, instead of 2,200 as in the other? A. This chart, Ex. No. 14, is our present arrangement, as we have it now.

Q. You mean you have now about 2,200 subscribers? A. That is our switchboard capacity at present. The one on the 1,200 basis is simply an arbitrary basis because the multiples are easily figured out.

The second chart here referred to, and identified by the witness, is offered in evidence by defendant's counsel, and is
352 filed herewith marked Defendant's Ex. No. 15.

Q. I wish you would take the chart, Ex. No. 15, and explain in your own way what it shows. A. Taking the first board of 1,200, which is marked in blue, that represents the line capacity of 1,200 drops, 1,200 answering jacks, and 4,800 connecting or multiple spring jacks. The second position, representing 2,400, is in orange, showing the line capacity and answering jack capacity as 2,400; the orange appears in the first board in multiples for connecting spring jacks, which shows that increased number of multiple jacks, 14,400. The third switchboard, representing a line capacity of 3,600, which is shown in green, represents in the first board multiple spring jacks, 24,000, showing the part that the second and third boards represent in the original or first board of 1,200. The next section, in red, shows the fourth 1,200, with a total capacity of 4,800 lines, and answering jack capacity, which is represented in the first, second and third series of 1,200s, representing 33,600 multiple or connecting spring jacks. In order to get at the total number of spring jacks over and above the first 1,200 the original board, the totals are added together, which represents a total of 76,800 spring jacks. In explanation as to how those spring jacks increase, the memorandum attached thereto shows that the connecting or multiple spring jacks increase according to the square of the increase in line capacity of the switchboard—showing the original 1,200, then the additional
353 2,400, with its multiple or connecting spring jacks, in the original 1,200; the answering jacks and drops increase in direct proportion to the switchboard capacity as seen in multiples of 1,200 each, and it will be seen that while the cost of framework, drops, answering jacks, keyboard equipment, &c., increases in direct proportion to the line capacity, the cost of connecting or multiple spring jacks increases according to the square of increase in the line capacity. Hence the first switchboard of 1,200 must be represented in the connecting or multi-

ple jacks by the increase of jacks in each one of the other three 1,200 sections, which makes a total of 76,800, instead of four times 4,800, which the original board contained.

Q. Are you able to tell us the cost of the framework, drops, answering jacks, keyboard equipment, and minor parts of the present exchange equipment here in Washington? A. Yes, sir.

Q. How much is it? A. The present switchboard of 2,200 capacity, cost, for drops, framework, answering jacks and keyboard equipment, $20,116.04. The 17,600 spring jacks—

Q. You have that many, have you? A. Yes, in the 2,200 capacity. The 17,600 multiple spring jacks cost $8,800. The cable and labor connecting the switchboard, its drops, its jacks, and the wire necessary for the same cost $5,136.23; making a total cost of our 2,200 line equipment capacity $34,052.27.

Q. That refers to the exchange office equipment? A.

354 The present exchange office equipment; yes, sir.

Q. Have you made any estimate as to what the cost would be of a corresponding equipment upon the same ratio of increase given in your Exhibit No. 14? A. Yes, sir.

Q. What are those estimates? A. To double our present capacity of 2,200, based on exactly the same price per article, would be $61,924.73. Those two added together would give the cost of a 4,400 line capacity switchboard.

Q. What would it be? A. $95,977.

Q. Have you any further figures on the subject? A. Yes, sir; I have the figures for the 6,600 capacity.

Q. What is that? A. Figuring on the same basis and adding another 2,200 line capacity, making a total capacity of 6,600 lines, with 158,400 multiple spring jacks, third 2,200 would cost $89,797.19. That added to the two 2,200 equipments preceding it would make the third or 6,600 capacity cost $185,774.19. We worked this up to 8,800.

Q. Go on, then, with what you have. A. To increase our present equipment to 8,800, or four times the present number, adding 2,200 more line capacity, would cost $117,569.65; making a total capacity of 8,800 subscribers' lines, with 281,600 multiple spring jacks necessary for multipling and connecting that number of subscribers cost $303,343.84.

355 Q. Upon what basis, as to articles and their quality and prices, have you made these estimates, Mr. Crandall? A. On the basis of the cost of the branch terminal switchboard, just the board we have in here, which is cheaper than the board we would replace this with.

Q. If your capacity were increased, say to 8,800 subscribers, what effect would the necessary extension of your switchboard, as you have described, have upon your location in this building?

A. It would be impossible to get it in on one floor of the building.

Q. How would it be if your capacity were increased to 6,600 subscribers? A. That could not be gotten in on one floor of the building.

Q. What part of the floor do you occupy now with 2,200 subscribers? A. The entire fifth floor of the building, barring the ladies' lunch room.

Q. How much more floor space would necessarily be occupied by an equipment, say for 8,800 subscribers, than by the present equipment for about 2,200? A. Over three times as much floor space.

Q. In the statement which you have given as to the cost of the present equipment, have you included the main and intermediate distributing board? A. Simply those two
356 boards; not any expense of the arrangement where they had to be placed.

Q. Simply the cost of the boards? A. Yes, sir.

Q. So far as your judgment goes, to what extent, if any, would it be possible, in increasing the equipment of the exchange, to meet such an increase in the number of subscribers? A. It would be impossible to do so with less than the expense estimated, to any extent.

Q. What is done in your department towards keeping a record of these transactions? A. In what regard?

Q. Any regard? A. All work or all reports that are made by me concerning my department, copies of them are taken, carbons are made; all testing of every character is reported on properly arranged forms and sheets, copies of which are kept on file; summaries of our daily troubles of all kinds are reported, and a complete record of every subscriber's complaint, of every transaction that I make in connection with the material or labor, is recorded.

Q. To what kind of troubles do you refer when you speak of your daily troubles? A. Reports made from subscribers' stations, or troubles with our switchboards, broken cords, &c.

Q. What is done, if anything, towards keeping an account of the property that comes into the hands of your department, or passes out of it, or is consumed in its operations? A.
357 The material that I handle is accounted for at the close of each day on regular forms.

Q. Accounted for to whom? A. To the storekeeper.

Q. Have you anything to do with the keeping of accounts of expenses of your department? A. Nothing, except the expense of any particular work while it is in progress, or until it is finished and reported.

Q. You do not handle the money? A. No, sir.

Q. Is there any difference in the character of the equipment

which you furnish to different classes of exchange subscribers? A. Yes, sir.

Q. What difference? A. In the style of equipment, the cost of it.

Q. Are there any classes among the subscribers in respect of the kind of property that they receive? For instance, as to metallic circuits and grounded circuits, is there any difference made? A. Oh, yes. On metallic circuits we use three different styles of apparatus or equipment, which are oak desk cabinets, wall cabinets and portable desk stands of very high grade and very expensive. In the grounded circuits, as a rule, the single back board and magneto bell are plain.

Q. What is the difference in expense to the company
358 in installing the apparatus relating to a metallic circuit and one fitted for a grounded circuit in a subscriber's office or place of business? A. The metallic circuit is pretty nearly double.

Q. Is there any difference in expense to the company growing out of the distance of the subscriber from the exchange or from the cable? A. That would not make any difference in my department.

Q. Is there any difference in regard to the cost of inspecting equipment, growing out of the distance of the subscriber from the exchange? A. Oh, yes.

Q. What is your inspecting system, in a general way? A. We have what is known as a periodical system of inspection; that is, we visit the subscribers' telephone once in forty days as a maximum, and once in twenty-seven days as a minimum.

Q. Does that apply all over the District? A. All over the District.

Q. Mr. Crandall, what can you tell us as to the depreciation that goes on in that part of the plant of which you have charge? A. There is a great deal of depreciation in parts of it. The office wiring very rapidly depreciates, especially is that the case where high grade insulation is necessary on account of our metallic circuits; we are compelled to run wire into all sorts of places, and the deterioration in some instances forces us to completely re-run the wire in six to eight months or a
359 year. How long the magneto bells will last depends on the use made of them by the subscriber; we have been compelled in two or three years to replace them entirely, as to the field magnets or ringer magnets, and almost entirely remodel the bells; there are other cases where the bells last five or six years in cases where the number of calls per telephone is limited.

Q. How as to the depreciation of that part of the equipment which is within the exchange itself? A. In certain portions of that the deterioration is very great; especially does that ap-

ply in the multiple spring jacks where they are plugged into thousands of times; the plug being of metal and the spring jack being of metal, we are called upon to place springs in the plug to enlarge the surface and make it fit closely to the spring jack. The wear in these jacks I should say would be fifteen per cent per annum. The drops do not generally depreciate so rapidly, because they are only called upon to respond to each ring; they are not plugged into, and there are no pieces of metal coming together to wear them out.

Q. What is the lifetime of the drops? A. I should figure between eight and twelve years.

Q. Taking the switchboard as a whole, how long does it live? A. Our experience in Washington between 1884 and 1894 has been that we have had to put in three entire new switchboards.

360 Q. In what year were they put in? A. No. 1 was put in in the winter and spring of 1884; No. 2 was put in in September of 1887; that was a multiple board. No. 3 was put in in July of 1894; that is the present multiple board.

Q. Now can you tell us anything more than you have as to why it has been necessary to change this expensive apparatus so often? A. The reason for the change from No. 1 to No. 2 was largely because No. 1 completely wore out; it was the first board built of that style, and it was not built as well as subsequent boards. No. 2 lasted from 1887 to 1894, barring the multiple spring jacks which were about worn out, representing about 14,000 spring jacks as nearly as I can remember; the rest of the board was in fair condition, but it was not a board suited to metallic circuit work entirely.

Q. I think I have not asked you, Mr. Crandall—and so I will now—to what extent, in that part of the work which comes under your supervision, the company conducts its business in an economical manner so as to keep expenses down to the lowest rate commensurate with good service? A. In my opinion, just as low as it possibly can; we are often refused articles that we feel are necessary.

Cross-examination.

By Mr. BIRNEY:

361 Q. Mr. Crandall, to what extent, and in what way, have you informed yourself of the cost in the market of various articles which come under your care in the setting up or installation of telephones? A. To a very limited extent, getting my information from the purchasing agent.

Q. From the purchasing agent of this company only? A. Yes, sir.

Q. Have you ever compared the prices paid by this company with the list prices of other manufacturers than those from whom these goods are purchased? A. No, sir.

Q. Then you really know nothing of the market prices of the articles which you use? A. Practically nothing.

Q. You say the capacity of the present switchboard in use is 2,400 drops, as I understand? A. 2,200.

Q. Is not the switchboard capable of more drops than that? A. Not the present one in its present condition.

Q. What would be required to change it? A. To add equipment just like it to it.

Q. Is there no part of the switchboard at present in use which is unoccupied by drops, and which might be fitted with more drops? A. Not more drops; no, sir.

Q. Then 2,200 drops is, as I understand you, the full capacity of the entire board which you have here in this ex-
362 change? A. Yes, sir.

Q. When that switchboard was set up you were in the employ of the company? A. Yes, sir.

Q. And did you have to do with the setting of it up? A. Yes, sir.

Q. How was it furnished to you—wired or unwired? A. Well, it was partially wired at the factory, and the rest was done here.

Q. Where was it manufactured? A. I think in Chicago; I am not certain.

Q. By what company? A. By the Western Electric Company.

Q. Are there other manufacturers of switchboards than the Western Electric Company? A. Not to my knowledge, as to multiple switchboards.

Q. You have no knowledge of any other manufacturers of multiple switchboards than the Western Electric Company. Do you consider yourself fully informed on that subject? A. Not as to the manufacture of materials; no, sir.

Q. Well, as to whether multiple switchboards are manufactured by other concerns? A. I do not consider myself informed on that subject.

Q. Then you do not know whether other houses than the Western Electric Company manufacture multiple switchboards or not? A. No, sir; I do not.

363 Q. Have you ever obtained prices from the Western Electric Company or any other manufacturer of switchboards for switchboards fully wired and equipped? A. I have never received prices; no, sir.

Q. Have you ever made any examination as to their cost? A. Yes, sir.

Q. From whom? A. From the bills as they come to the purchasing agent, and the material that went into the switchboard.

Q. That is the only way? A. When estimating on furnishing the switchboards.

Q. Then your experience as to that is limited to what you had in the setting up of this particular board and the knowledge you obtained in connection with that? A. These particular boards; several boards have been set up.

Q. The three several boards which you have mentioned as having been set up in 1884, 1887 and 1894? A. Yes, sir.

Q. Where did the boards set up in 1884 and 1887 come from? A. Both, I think, from the Western Electric Company; I am not positively sure about the first one.

Q. Have you made any inquiry to determine whether the prices of switchboards and their equipments have
364 changed since 1894? If so, what inquiry? A. I have made very little inquiry as to the change of prices relating to this particular style of board with which we are dealing.

Q. What inquiries have you made, and from whom? A. The style of switchboard that we are figuring on at present for other purposes, I have made inquiries about, and the prices about compare—are rather a little more than the prices of the board that we purchased in 1894.

Q. It is a different kind of board, is it, which was put in in 1894? A. In the main it has about the same arrangement, but the apparatus is somewhat different.

Q. Of whom have you made inquiries touching such board? A. From the Western Electric Company, as I know of no other concern manufacturing that style of board.

Q. Do you know of other styles of board in use in other exchanges? A. May I ask whether you mean other styles than the Western Electric Company manufacture?

Q. Yes. A. No; I do not know of any style other than that multiple switchboard manufactured by the Western Electric Company.

Q. Have you made any extended examination of switchboards in exchanges in other places? A. Not very extended, but in a few cities.

365 Q. Which cities? A. Philadelphia, New York, Boston, Brooklyn and Chicago.

Q. Have you ever examined the switchboards in any other exchange than those which were the licensees of the American Bell Telephone Company? A. Never officially.

Q. Have you done so unofficially? A. I have simply seen some switchboards in one place; I was not examining them at all.

Q. You did not investigate them? A. Not at all; I just happened to see them.

Q. You say that the expense of installing a metallic circuit instrument is nearly double that of a grounded circuit instrument; can you tell us what is the cost of installing a grounded circuit instrument? A. I think I have the figures pretty near-

ly exact. It varies a great deal, of course, according to the particular style of equipment used.

Q. Take the ordinary wall cabinet, grounded circuit equipment? A. The cost of a grounded circuit equipment complete, labor, wiring and all, figures about $15.50 per set; that is the ordinary grounded circuit.

Q. What do you mean by that, Mr. Crandall? What are the items that go to make up that $15.50? A. The bell, back board, battery, wire, time—the entire expense of putting
366 it in.

Q. Then you include in that the full equipment? A. Yes, sir.

Q. Does this company own the equipment? A. The bell and backboard. I do not include the instrument.

Q. You do not include the transmitter and receiver? A. No, sir.

Q. Then, except the transmitter and the receiver, this company owns the remainder of the equipment? A. Yes, sir.

Q. Do you include in that any part of the rental paid for the receiver and transmitter? A. No, sir; just the labor and the material.

Q. How much time does it take to install one? A. That depends largely upon where it has to go, Mr. Birney.

Q. What do you charge in this estimate for the labor of installation? A. The charge for putting in the telephone?

Q. Yes. A. I have made an average charge, for average time, including the time of those engaged in putting in the service, and in this case it is something over $6 per telephone.

Q. What are the items which go to make the difference between the grounded circuit equipment and the ordinary
367 metallic circuit equipment? A. It depends on what sort of metallic circuit equipment it is.

Q. I speak of the ordinary wall cabinet, metallic circuit equipment, which is the most usual style, as I understand; am I right in that? A. We have several styles.

Q. Is that the most usual style? A. I think ours are pretty nearly divided as to style.

By Mr. WORTHINGTON:

Q. Divided between wall cabinet and what? A. Wall cabinet, wall set, portable set, and the wall cabinet—four different styles of metallic circuit equipment.

By Mr. BIRNEY:

Q. I want to compare the two services, and to do that I want you to take that metallic circuit equipment which most nearly approaches the grounded circuit wall cabinet equipment, and tell me what it would cost for installing that, and what are the

items of difference between that and the grounded circuit equipment. A. I cannot just give you that. I have figured particular styles of our metallic circuit equipment and have made an average of the entire cost per station of equipment.

Q. Then you have not figured on the separate styles? A. Not on the separate styles. I have taken the total number and made an average of the actual cost of installing each

368 set.

Q. Where is the difference in cost found? A. We have three times as much battery in one case as the other; we have more than double the cost of wire; nearly double the cost of backboard; more than double the cost of the man's time who puts up the apparatus—the cost of putting up and protecting our metallic circuits that we have to use for that particular style of service.

Q. What does each battery cost? A. That varies. We use various kinds of batteries.

Q. The most ordinary battery, the one most frequently used? A. I do not know personally just what the battery costs.

Q. Who should know if you do not? A. The purchasing agent would know what he pays for batteries, and that varies, I think.

Q. Why should it vary? A. Because of the different styles of battery.

Q. Have you no information as to that? A. I have approximate information.

Q. Well, give it approximately. A. They run from fifty to eighty cents per cell.

Q. In a metallic circuit equipment you use three cells? A. We use three cells of a certain kind of battery in some cases, and two cells of battery in others; it depends on what use is to be made of the telephone.

369 Q. How much wire do you use in putting in a set? A. That varies very much.

Q. What are the maximum and minimum quantities? A. In an installment they take about 800 feet of wire, and I have known it to run as low as 100 or 150 feet.

Q. Have you made an average? A. I should say the average would be about 250 feet.

Q. What kind of wire is that? A. That varies very much. We have different kinds of wire.

Q. How do you determine what kind of wire to put up? A. It depends on the place where we have to run it.

Q. What determines the kind? A. Whether it is in a cellar or dry place, whether it is moderately damp, whether it is very hot—these elements determine the kind of wire we use.

Q. Is there any difference in the cost of wire? A. Very much.

Q. Do you not use more of one kind of wire than of others? A. Yes.

Q. What is that wire? A. That is rubber braided wire, principal okonite, rubber covered wire.

370 Q. What is the cost of that? A. That I cannot tell you from my own recollection.

Q. Do you know to what account this work of installing telephones is charged on the books of the company, whether to construction or to maintenance? A. I have no personal knowledge of how the charges are made; I know how the material is used.

Q. Do you know to what account that is charged. A. No, sir.

Q. Were the switchboards of 1884 and 1887 made use of elsewhere, after being discarded here? A. No, sir.

Redirect examination.

By Mr. WORTHINGTON:

Q. What was done with the mortal remains of those old switchboards? A. They went to junk, so far as I know.

J. E. CRANDALL.

Adjourned to meet at 3:20 o'clock to-morrow, Wednesday, November 30th, 1898.

Subscribed and sworn to before me this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

371 Washington, D. C., *November* 30, 1898, 3.20 o'clock p. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. BIRNEY and Mr. HEMPHILL.

Present on behalf of the defendant, Mr. WORTHINGTON.

BURNET L. NEVIUS, Jr., a witness of lawful age, called by and on behalf of the defendant, having been first duly sworn, is examined,

By Mr. WORTHINGTON:

Q. What is your age? A. I am 34.

Q. Where do you live? A. In Washington, D. C.

Q. What is your occupation at present? A. I am chief operator of the Chesapeake & Potomac Telephone Co.

Q. How long have you held that position? A. Since the beginning of the Company.

Q. Ever since 1883? A. Yes, sir.

Q. What were you doing prior to 1883? A. I was in the operating room prior to that; I was chief operator, I think, prior to the organization of this Company.

Q. How long have you been directly connected with the operating room? A. I have been in the operating room
372 since the beginning of the telephone business in Washington.

Q. In 1878? A. Yes, sir.

Q. State in a general way what are the duties of your present position? A. As chief operator I have charge of the operating department, overseeing the work of the operators, arranging their hours, and making recommendations for the appointment of new operators when they are required, hearing complaints from subscribers relating to the service or anything that pertains to the operating room.

Q. Where is the operating room of the Exchange? A. It is located on the fifth floor of this building.

Q. That is the building known as the Small Building? A. At the corner of Fourteenth and G, No. 619 Fourteenth street.

Q. How many stories has this building? A. Five.

Q. On what floor is your department? A. On the fifth floor.

Q. What is you salary? A. $1200 per annum.

Q. How long have you been paid at that rate? A. Since 1891.

Q. Have you any assistants or subordinate officials in your branch? A. We have an assistant chief operator during the day, a lady.

373 Q. She is there during the day? A. Yes, sir; and we have one clerk in the department.

Q. Are the others all operators? A. There is one supervising operator not directly attached to the board or connected with the work of the board. She walks behind the operators at the board and supervises their work.

Q. How many operators have you at present? A. We have 35 employes, including those two assistants, in the operating department.

By Mr. HEMPHILL:

Q. That is, including the assistant chief, and the supervising operator? A. Yes, sir.

By Mr. WORTHINGTON:

Q. What compensation does the assistant chief receive. A. $8.50 per week.

Q. What compensation does the supervising operator receive? A. The supervising operator receives $6.25 per week.

Q. Is that a lady? A. A lady also.

Q. Are your operators all women? A. All females, yes, sir --all the day operators, I should say. There are three night operators who are males, and who work from 10 o'clock at night until 7 in the morning. Aside from that the opera-
374 tors are all ladies.

Q. Then you have to add to the 35 operators those who are here at night? A. No, sir; that includes the three at night, the total operating force.

Q. What is the compensation of the operators? A. The average pay of the operating force is $5.91 per week, excluding myself and the janitress of the building. Of course they appear on the same roll. That embraces all the assistants and all the operators.

Q. You do not class the janitress as an operator? A. Not at all.

Q. From your experience in this business, and especially in the Washington exchange, what do you say as to whether any of these employes under you could be dispensed with or not? A. I think we are running the office in a very economical manner. I have given a great deal of attention to that subject during the time I have been there.

Q. What do you say as to whether their compensation is excessive or moderate or small? A. I think their compensation is moderate.

Q. How does the office force that you have now compare with what you had about the 30th of June last? Has there been any particular change? A. We have 35 operators now—about the same number; I think there has been no change from the 35.

Q. I wish you would describe in a general way the
375 construction and operation of the apparatus of which you have charge. A. Our switchboards as we term them, consist of eight sections of board which are joined together, forming something of a semi-circle in their arrangement in the room. The operators sit on the inner side of that semi-circle, they being arranged in groups of three for each section of board making a total of 8 times three, or 24 operators' positions on the board altogether. The lines connecting the switchboards are divided into sections of 100 each, teminating in drops, as they are ordinarily called, or annunciators similar to the annunciators in hotel offices. Our operators take care of 100 subscribers' drops.

Q. You mean each operator? A. Each operator. These drops have connected with them before the operator and distributed above the keyboard, what are termed the answering jacks, there being one answering jack for each subscriber's line. Before each set of three operators, one entire section of the switchboard, we have represented in the multiple jacks

all the subscribers' lines entering the office. When a subscriber calls his drop is thrown, and in falling makes a contact which lights an auxiliary electric lamp before the operator, thus attracting her attention to the call; and she, in answering the call uses one of a pair of cords before her, the answering cord being connected with the answering jack; she then, by a movement of the lever, brings her telephone in circuit, and asks what number is wanted; when the number is
376 received from the subscriber, the operator connects with the desired number, if it is not already in use.

Q. How does she do that? A. She connects with the other cord of that pair. When the plug is inserted in the multiple or connecting jack, by the depression of a ringing key, the electric current from a generator in the Exchange causes the responding subscriber's bell to ring. When he responds, conversation is had between the two subscribers, and when conversation is completed the subscriber is expected to ring off. When the ring off signal is given a clearing out drop attached to the pair of cords in use will be thrown, again lighting the auxiliary lamp, thus indicating to the operator that the subscribers have completed their conversation. The operator then, for a moment, switches her telephone in circuit by the operation of a lever, and makes inquiry as to whether they are through with their conversation; if there is no response, the lines are disconnected, and that connection is completed. Each operator is provided with fifteen pairs of cords for such service from her position. As I have stated, there are eight sections of switchboard in the room, and the entire number of lines entering the office or in our present board, 2200, are represented on each section of the board, thus placing before each set of three operators facilities for getting in on any subscriber's line in the system. If a line is already in use when a subscriber calls,
377 that fact is discovered by the operator in her attempt to put the plug in that number; that discovery is made by means of an electrical test which is heard in the operator's receiver the instant the contact is made between the plug and the mouth of the spring jack or connecting jack. I think that describes the operation.

Q. You say, if I understand you, that each section which contains three operators' positions, is connected with all the subscribers? A. All the subscribers' lines enter each section.

Q. Please tell us whether or not each operator without aid from another operator, or without leaving her position, can put any one of the subscribers of whose lines she has charge, in connection with any subscriber in the Exchange? A. Yes, sir; that comes from the use of the multiple system, and in that respect the multiple system differs from the systems used in the earlier years of the company. I think that feature, more than

anything else, renders the service of to-day more rapid than it was in the earlier years; connections may be made by the one receiving the call without going through the hands of another person. In the earlier years the situation was about this: on a series of boards in the operating room, supposing the operator had 100 lines in charge, if she wanted a subscriber on any other board than the one she was on, it was necessary for her to connect with a cross-connecting strip and call out to another operator in another part of the room to make another connection, that would complete the connection de-

378 sired.

Q. Have you, at my request, prepared any statement showing the number of subscribers in the exchange at different times, and the number of calls per subscriber? A. I have looked over that ground, and I have before me now a memorandum from which I can read if desired; the memorandum is roughly made.

The paper which the witness has produced in answer to the last inquiry above, is offered in evidence by counsel for defendant, and is herewith filed, marked "Defendant's Exhibit No. 16."

Q. Please take this statement, which has just been introduced in evidence, and explain it in your own way from beginning to end. A. In the year 1892 we had 1722 subscribers making on an average 8 daily calls each. In 1887 the number of subscribers was 1299, making an average daily number of calls 4½ each. The total increase in subscribers in this period was 423. The increase in calls was 3½ per subscriber per day. The percentage of increase in subscribers was 32½. The percentage of increase in calls was 78.

Q. You have a memorandum there, I see, as to party lines; please tell us what that means, and its significance in this connection? A. In the year 1887 70 per cent of our subscribers were on party lines. In the year 1892, but 19 per cent. of the subscribers were on party lines.

379 Q. What has that to do, if anything, with the average number of calls per subscriber per day? A. In my opinion, the large percentage of subscribers on party lines in 1887 had a great bearing upon the number of calls made by the subscribers at that time, upon the average daily number of calls.

Q. What is meant by party lines? A. A party line is a line consisting of more than one station; it may be anywhere from two to six stations.

Q. How did that affect the number of calls? A. Because of the fact that where there were a number of subscribers on one line each had to share in the use of it, and the record seems to indicate that on that account the calls were limited in

proportion to the calls made in other years when the proportion of subscribers on party lines was very much reduced.

Q. Have you had any experience from which you can inform us as to whether or not a man uses his telephone oftener, or not so frequently, when he is on the same line with five or six others, as when he has only his own telephone on the wire? A. I think what I have here will indicate in a measure what the effect of these different conditions would be. In the years 1892 to 1897, that is after 1892, we had about 19 per cent. of the subscribers on party lines; the number of calls increased from eight to ten between the years 1892 and 1897.

380 Q. You mean per subscriber per day? A. Yes, sir. The total number of subscribers had increased but 100 in number between those years, indicating an increase in percentage of about 5 4-5, against an increase of 25 per cent in calls. For the whole period mentioned between the years 1897 and 1885, we find that the total number of subscribers increased 726 in number, or about 66¾ per cent., while the calls increased from 4 1-3 to 10 per subscriber daily, showing an increase of 5 2-3 in the calls or a percentage of about 130.

Q. Have you, at my request made a computation of the result in case the number of subscribers should increase in certain proportions hereafter, as to what the result would be with reference to the number of calls. A. Yes, sir; I have.

Q. What is the result? A. Based upon the record for the years 1894, 1895, 1896, and 1897, when the average number of calls per day per subscriber was 10—

Q. You mean ten per day per subscriber during that whole period, or that each year it would average about that? A. In each year they averaged 10, not for the entire year, but during the time of the year when we would be justified in basing our calculations for the future growth, as to what an operator might handle. In other words, we had to estimate upon an operator not taking more business during the busy time than she could handle. If at any time the number of daily calls per subscriber averages 10, it is sufficient to base it up-

381 on that. There have been some days when the calls would run higher than that in some of these years, but as a rule that is about a maximum.

Q. Let me ask you there if the total number of calls varies considerably at different times of the year? A. It does vary considerably at different times of the year. In the summer months there is a decrease in the number of calls.

Q. Let me also ask you whether the number of calls varies at different times in the day? A. It varies in the day too, of course.

Q. What is the busiest time of the day? A. The busiest hour of the day sometimes occurs between nine and ten in

the morning, and sometimes between ten and eleven; and we have to take care of the work at the busiest time as well as at any other time in order to give proper service.

Q. Proceed with your statement. A. With 1800 subscribers in the years mentioned here, ten calls per subscriber daily, would result in 18,000 calls per day. With 18 operator positions this would average about 1,000 calls to each operator. Upon this basis, referring to the calls and the number of subscribers we have—2250—an increase of 450 subscribers, or 20 per cent. if we would estimate the calls increasing in the same proportion that the subscribers have increased, there would be about 12 per day. With that number of subscribers, at 12 calls per day, 21 operators would have an average of 1286 calls each, which would give to an operator just as much as she could take care of, even if at that rate they could be

382 taken care of properly.

Q. What is your judgment from your experience as to how many calls per day an operator can take care of? A. In my judgment, 1286 calls per operator per day would give to the operators as much work as they could properly take care of at the busiest hour of the day, which is the time we have to take care of. The figures in the lower part of exhibit No. 16 look towards the doubling of the present number of subscribers.

Q. I wish you would state what that is, and how you reach the results you have indicated. A. To double the present number of subscribers, 2250, would make a total of 4500 subscribers, making 24 calls daily instead of 12, and giving us a total of 108,000 calls, or 1,286 calls per operator. With this number of subscribers we should require 84 operators, whereas we now have 21, thus quadrupling the operating force.

Q. As a result of doubling the number of subscribers? A. As a result of doubling the number of subscribers.

Q. What can you tell us, from your experience, as to the effect upon the switchboard, and the apparatus pertaining thereto, resulting from an increase in the number of subscribers? A. Under the conditions stated here, the number of subscribers being doubled, the operators, instead of being able to take care of 100 subscribers each at the present rate of calls, and in order to maintain the present rate of calls per

383 operator daily, would be able to take care of but half the present number of subscribers, or fifty, at double the present rate of calls per subscriber. This arrangement of subscribers to be attended to by each operator would require a change in the switchboard arrangement. Thus, instead of our having 100 subscribers' lines before an operator, and 300 to a section, as we now have, we should then have but 50 subscribers' lines before an operator, with a total of 150 per section. Thus, to provide for the total increase in the number of subscribers to 4500—

Q. From 2250? A. From 2250 to 4500, there would be required four times the present switchboard arrangement.

Q. What space is there on the floor where you are located, where such an increase could be provided for? A. Well I have made no measurements and cannot state exactly, but I am under the impression that we should have to occupy about double the space occupied at present.

Q. If you were called upon to quadruple it, what would happen? A. It would be impossible to get the force on the same floor, of course.

Q. Can you carry on the operations by having part of the operators on one floor and part on another? A. It would be quite impracticable to divide the office in that way.

384 Q. From exhibits No. 7 and No. 11 in this case I see that the number of exchange stations here from 1884 to 1898, increased from 954 to 2106, while the number of operators during that period increased only from 19 to 35, and that the operating expenses increased during that period from $7,980 to $17,065. This increase seems to be at a less rate, in proportion to that increase in the number of subscribers, than the increase given in your estimates. Are you able to give us any facts which will enlighten us as to the reason for the difference? A. I think the explanation of that is that from the earlier years of the work up to within recent years, the rate of calls per subscriber has been so low that an operator could readily take care of 100 subscribers, during the various years. But doubling the present number of subscribers, and doubling their daily rate of calls would show a very different result, and in my opinion would quadruple the operating force.

Q. For how many subscribers were your operators' positions arranged on your former switchboards. A. The arrangement of our switchboard has always contemplated an operator handling 100 lines, in other, words, 100 drops to each position. In the year 1887, for instance, we observed that 70 per cent. of our subscribers were on party lines. With that arrangement there was a certain percentage of the equipment that they were unable to use; I do not know the exact percentage; that I have not obtained.

385 Q. Why were they unable to use it? A. Taking 4 subscribers to the line, 25 lines would make 100 subscribers. You can see how that would be. An operator is ordinarily supposed to take care of 100 subscribers. So that more than one on a line would be taking care of more than 100 subscribers. The increase in the operating force, as shown by this statement, occurred somewhere from 1887 to 1890; in that time there was considerable increase. The increase in the operating force from 1889 to 1890, I think is largely explained by the fact that many of the subscribers

about that period were changing from party lines to single lines, or from the general circuit line to what we would call semi-special lines, which would mean a two-party line.

Q. Has anything taken place in recent years with reference to giving subscribers a different class of service and which tends to reduce the number of calls per subscriber? A. Yes, sir; the introduction of the measured service.

Q. Explain what the measured service is and when it was introduced. A. I do not recall the exact time when it was introduced; I think in the year 1896 the first were put in. The measured service contemplates a rate, I think, of $66 a year for perhaps 600 calls; that is, a measured service one-party line.

Q. Please look at the card I now hand you, and state whether it shows the present rates of the Company as regards measured service, and the terms upon which subscribers can obtain it. A. I do not know that I am competent to state
386 as to that from the fact of there having been some change recently. The result of this change to measured service has considerably reduced the number of calls per subscriber for those having measured service.

Q. How has it operated to do that? A. The rate of calls in January of this year was a fraction over 2 calls per day for each subscriber on measured service on the average.

Q. Have you also here what you call pay stations introduced recently? A. Yes, sir; during the year 1897 the pay stations were introduced.

Q. What are they? A. What we term the Gray Automatic Pay Stations, and they are located chiefly in the drugstores of the city. We had in January of 1898 about 132 such stations, making an average of 2 1-5 calls daily, about the same rate as the measured service.

Q. What is the total number of subscribers who are upon the measured service? A. Some time in the month of January, 1898, there were only 163.

Q. What then was the total number of pay stations and measured service subscribers at that time? A. 295 in all.

Q. Are they included in the 2250 subscribers whose average daily calls you have been giving us? A. They are in-
387 cluded with some additions; there have been some few additions, of course, since that date.

Q. You mean that at the present time there is a greater number of pay stations and measured service stations? A. The pay stations I think are not so numerous at this time; there is a somewhat greater number of measured service stations.

Q. Whatever the number is, it approximates the number you have given us, and they are included in the 2250 as to which you have been giving us the average daily calls per subscriber? A. Yes, sir.

Q. Can you tell us the average number of calls per subscriber, omitting the measured service and the pay stations, so that we may see what will happen when we are on the rate prescribed in the act of Congress? A. I have not figured that out. My estimate was based on the experience during the years when we had not the conditions of pay stations and measured service, which I assumed to be a fair basis, taking the average for years when the rate of calls per subscriber was the same.

Q. What is your experience as to what difference, if any, is shown in the number of times a subscriber uses his telephone, as between measured service and unlimited service? A. From what I have stated as to these subscribers, there would be about 2 1-5 calls per day each for the measured service, while experience shows that the subscribers have made as
388 high as 10 calls when they are in any other kind of service.

Q. You are speaking of averages? A. Average calls per subscriber.

Q. What can you say as to whether or not the telephone is used by subscribers for trivial and frivolous matters in many instances, where the service is unlimited, and pays the flat rate, no matter how many times he uses the telephone?

Question objected to by complainants' counsel as calling for an expression of opinion from the witness upon the character of the messages.

A. I think the facts here as I have stated them, bear out the idea that when each call is paid for the use of the telephone is very much more limited than when the service is wide open and free.

Q. Let me ask you this question: In the estimate which you have made as to what would happen in case the present number of subscribers was doubled, you have allowed for 24 calls per day, instead of 12 as at present. Why do you do that? A. The experience shows here, as I have stated, that the rate of calls doubles or more than doubles as the number of subscribers doubles. For instance, we may illustrate that in this way: If we have 100 subscribers making 10 calls each per day, there would be 1,000 calls. If we double the number of subscribers and double the number of calls to 20 calls each, we have 4,000 calls, and the work is four times
389 greater than with the present number of subscribers.

Q. But my question is as to what is your experience as to whether or not, when the number of subscribers is doubled, the use of the telephone by each subscriber also doubles. A. I think that is borne out by the statement I have made here.

Q. Mr. Nevius, is there any considerable difference in the number of times the different subscribers use the telephone,

or do they all use it about the same number of times? A. No, sir; there is quite a variation in that.

Q. How does it range? A. It runs all the way from a fraction of a call per day to 100 calls per day, per subscriber.

Q. How many sets of switchboards have you had in the exchange here in the last fifteen years? A. We have had three different sets of multiple switchboards.

Q. And in what years were they respectively put in? A. The first board was installed some time in 1884. The next board was installed in September, 1887. The present switchboard was installed in July, 1894.

Q. Was there any difference in these switchboards as regards the amount of business that one operator could transact while they were in use? A. There is a marked difference in the multiple switchboard from the boards that were used before we had the multiple boards, and there have been
390 improvements in each set of multiple switchboard put in. The multiple board put in in 1884 was a crude board of its kind, being then only recently adopted for exchange use. The board we had was about seven and a half feet in width, and while it was a great improvement over the other boards, yet it did not compare very favorably with the present board, and the board that came in between in this respect: the cords were swung from the ceiling overhead and were not in so close proximity to the connecting jacks; the drops were of a very much larger type than those used on the second board or the present board, and were restored by hand; one pair of calling keys answered for service on all calls passing through an operator's hands; and it was necessary with the first board for the operator to be in circuit while she was calling, thereby taking her time until the ringing was completed. This board was in use, as I have stated, from 1884 to 1887, at which time it was practically out of date. The set of multiple boards No. 2, were a great improvement over the first set, they were narrower, being in the neighborhood of 5 feet in width, and rendering it much easier for the operators to reach any desired number. With these boards there was a set of jacks for answering purposes exclusively. The cords were arranged below the board rather than above, and were in close proximity to the answering jacks, and there were a greater number of cords for each operator's use. In addition to this, there was a separate pair of ringing keys for each pair of connecting cords, giving the operators fa-
391 cilities for ringing on each cord whether her telephone was in circuit or not, thereby greatly saving the time of the operator in handling her work. This board was termed a series board. Just before it was removed the contacts in the spring jacks gave serious trouble, to such an extent as to af-

fect the service at that time. The period during which this board was in use was about 7 years. The last set of boards, the present set, is far superior to either of the former boards: valuable space immediately in front of the operator is now occupied by connecting jacks, placing the jacks nearer within the reach of the operator than either of the former boards; the drops are all self-restoring, both subscribers' drops and clearing-out drops; subscribers' drops being just above the operator; and with this board the auxiliary electric light is a valuable feature in immediately attracting the operator's attention when a call occurs. The vast improvement of this board over either of the others is that it is free from the difficulties experienced in both the former boards, that is, the poor contacts in the spring jacks. This is largely owing to its being a bridging board, which is also adapted to metallic circuit service.

Q. To what extent, if at all, was the ability of an operator to transact business with the board in 1887, increased over that of the board in use in 1884 by the improvements in the second board over the first? A. The features I have mentioned, of having the separate ringing keys, the special set of jacks termed the answering jacks, and the nearness of the
392 connecting cords to those jacks, were all features tending greatly to save the time of the operator.

Q. How was that in respect of a comparison between the board of 1887 and the board of 1894? Could the operators transact more or less business with the board of 1894 than that of 1897? A. The operator can give much better service with that of 1894.

Q. I ask in respect to the number of calls per day which an operator could properly care for. A. She can attend to more calls. This board has reached a high state of perfection at this time. The automatic feature or self-restoring drop feature, is one thing that saves the time of the operator very much, the connecting jacks being placed nearer within the reach of the operator, and there being an improvement also in the arrangement of the answering jacks over the second board, which gives another advantage.

Q. I will get at this in another way: Tell me what was the average number of calls per operator or per operator's position, which is the same thing, in 1887. A. In 1887, the operators handled about 584 calls per position per day.

Q. How was that, say in 1890? A. I would add that at that time when 584 calls were handled, those calls were made by 130 subscribers, rather than by about 100, which is the average number at the present day?

393 Q. Each operator then was in charge of 130 subscribers? A. Each position had charge of 130 subscribers, owing to low rate of calls the subscribers made at that time.

Q. And notwithstanding the defective switchboard? A. Yes, sir. In 1890 the operators were taking care of 133 subscribers each, with an average of about 799 calls per position per day. The number of subscribers per operator's position has from that time to this decreased, while the rate of calls per subscriber has increased. From 1894 to 1897 the number of subscribers per operator was about 101, bringing us up to a point where the entire drop capacity per operator was used, and the calls were increased to 1,012 per operator's position, showing that as the rate of call per subscriber has increased the number of calls per position has increased, and the subscribers per operator have decreased.

Q. What can you tell us as to whether, in the present state of the art, if the number of your subscribers were largely increased, say doubled, there could be any improvement made in the switchboard system, which would counteract the necessity which you have heretofore exhibited theoretically for a very large increase in the number of operators? A. I have no personal experience with boards except these with which I have been personally in touch, and I do not know that I could testify as to improvements in switchboards.

Q. You can testify whether you know of any. What I want to get at is whether, so far as you know, there are any
394 means of increasing, beyond the present rate, the number of calls per day, so as to enable an operator to take care of more calls per day than she can now. A. I think with our present board that if we were called upon to do that the operators, as I stated earlier in my testimony, would be able to take care of but half the number of subscribers that they do at the present time, that is, if the number of subscribers were doubled.

Q. But what I want to get at is whether there are any means known to you, by which, without reference to whether the number of subscribers is increased or not, one operator can take care of any more calls than she is taking care of now. A. We have reached the maximum on this board. We could not go beyond this with any degree of safety to the service; that is, we would impair the service if we put upon the operators more work than the record shows that they have been doing, and that I have stated they have been doing.

Cross-examination.

By Mr. BIRNEY:

Q. What record is kept of the number of calls? A. We keep a record from time to time of the number of calls answered by subscribers.

Q. What do you mean by from time to time? A. Well, that has been done periodically through the years. Now we do it monthly.

Q. Do you mean that you keep a record of all the calls
395 made throughout the year by each subscriber? A. No; we do not keep a record of the calls made throughout the year. We set apart one or more days in each month now, when we take what is termed a peg count of the calls.

Q. Of all the calls on those one or two days? A. Yes, sir.

Q. That is the extent of your record at present of calls made by regular subscribers? A. Yes, sir.

Q. When did that system of records of one or two days in the month begin? A. I cannot say that I recall just when it began. Through the years there have been times when a record has been made such as I have stated; but it is done now regularly at least once a month.

Q. When did you begin keeping a record once a month? A. Some time in this year; throughout this year we have done that I think, and perhaps part of last year; I cannot remember exactly when it began.

Q. And before that time did you take the number of calls on any specified days or irregularly? A. On irregular days.

Q. And how frequently? A. A number of times during the year; I do not know that I could say just how frequently. I might say through the years from 1894 up to the pres-
396 ent I think the record was taken as much as a dozen times, perhaps more than that.

Q. A dozen times a year or a dozen times between 1894 and 1898? A. A dozen times a year almost.

Q. Have you anything from which you can inform yourself certainly upon this point? A. Yes, sir; the testimony I have already given is based upon the records that we have taken.

Q. Then you have a record from which you can tell me how many times you took the number of calls per subscriber in 1894 and from that time to 1898? A. It is possible for me to make a statement of that kind; I cannot recall just now nearer than I have stated.

Mr. BIRNEY. We shall have to ask that that be done.

Mr. WORTHINGTON. Certainly.

By Mr. BIRNEY:

Q. How was it before 1894? A. We have some records taken by that same method before that peg counts, but I cannot recall just now how much further back that is; possibly it goes back to 1890.

Q. Can you now recall how frequently between 1890 and 1894 these peg counts were taken? A. No, sir; I cannot recall exactly.

Q. Have you any records which will show? A. We have the same record on that, I think, that we have later than 1894, just spoken of—the same kind of record, peg count record.

Q. How far back does that record run? A. The rec-
397 ord of that kind is about as far back as 1890, although there was a record taken previous to that in each year.

Q. One in each year? A. At least one in each year, probably more than one.

Q. Who took that record? A. The records were taken by the operators.

Q. Who took the record between 1890 and 1898? A. That record was also taken by the operators.

Q. Explain how that was done. A. We furnished each operator with a peg or blind plug that may be used in the sections of spring jacks; those sections of jacks are arranged in groups of 100 each, and when an operator answers a call she begins with No. 1, puts the peg used for it in No. 1; each time she answers a call she moves the peg up one number. That is done throughout each hour of the day, and at the end of each hour a register is made of the number of calls the operator has answered.

Q. By what method did you arrive at the average number of calls with reference to which you have testified? A. Per subscriber?

Q. What was the material you used to reach that average? A. You are asking now about the average number of calls per subscriber, I suppose?

398 Q. Yes. A. We take the total number of calls answered in the course of the day, and divide that by the number of subscribers we have at that time.

Q. What days did you use in determining your average? A. I cannot answer as to that exactly. We take various days.

Q. I am asking you now touching averages about which you have testified here. What days did you use in making up those averages? A. I cannot fix the days in my mind; they are matters of record.

Q. Did you use all the days in the year in which tests had been made? A. No, sir.

Q. How many of those days upon which peg records had been made did you use? A. We used several days in each year.

Q. Have you anything here present which will give you the days you used in 1897? A. No, sir. All I have here is the statement I have made, without the days upon which the figures were taken.

Q. Can you tell how many days in 1897 you used in making up your averages? A. I do not recall whether it was two or three or four. We struck an average by taking several days, putting them together, and dividing by the number of days, thereby getting the average per day, and dividing by the
399 number of subscribers in the way I have explained before.

Q. But you did not use all the days in the peg tests you made? A. No, sir. I would like to explain that upon any day in the year when the average calls would apply, it would be safe to estimate the operating force accordingly.

Q. That you have already explained? A. Yes, sir.

Q. Does your answer as to the days upon which you made these tests in 1897 apply equally to 1896 and the previous years? A. I think it applies to each.

Q. You cannot tell how many days in each year you used in making up your statement of averages? A. I did not fix that upon my mind. I got averages in about the way I stated. I took several days together.

Q. But you did not use all the days upon which tests were made in each of those years? A. No, sir.

Q. Is it your experience, Mr. Nevins, that as the particular subscriber becomes more familiar with the use of the telephone he employs it more frequently? A. Do you mean any subscriber?

Q. Anyone. A. I do not know that I could say that his use is based upon that reason, as he becomes more familiar with it. I think the use of the telephone by the subscriber is based upon the number of subscribers he can call, rather than for any other reason.

400

Q. Then you do not think the increase in the number of calls will be found where the number of subscribers remains the same? A. In the statement I made—

Q. Never mind about that. Please answer my question.

Mr. WORTHINGTON. You can answer in your own way.

A. With reference to that matter the record indicated that while the number of subscribers was about the same the average number of calls remained about the same during the period of several years.

By Mr. BIRNEY:

Q. Then, given an exchange, any of 500 subscribers, in 1896, and the same number in 1897 or at any later period, you would not expect to find an increase in the number of calls by those subscribers?

Mr. WORTHINGTON. I suggest that the counsel state whether he assumes an exchange that has been in use for a considerable period of time, or for the first year of a new one, because it is manifest that for the time at least the new subscribers would increase the use of the telephone, while subsequently they might not. But I submit that the question is not fair to the witness for that reason.

Mr. BIRNEY. Answer the question.

Mr. WORTHINGTON: And since, upon this suggestion, the

question has not been amended, I now object for the reasons stated.

A. You do not mean the same number; you do not
401 mean an additional number?

Q. No, sir. A. The record I made does not indicate that there was any change in the number of calls for a period of years.

Q. To what record do you refer? A. I might say I refer to the calls made in the years 1894, 1895, 1896 and 1897, when the rate of calls was ten per subscriber, the number of subscribers for those years being approximately the same.

Q. Then you do not agree that as the subscriber becomes more familiar with the use of the telephone he uses it more frequently? A. I can only base my statement upon the record.

Q. I ask you your opinion upon that question. A. I am obliged to be governed in my opinion by the records.

Q. State your opinion, whatever it is. A. My opinion is that it would be as I have already said, that where the subscribers remain the same in number the number of calls per subscriber would be the same.

Q. I think you have already expressed the opinion that part of the increased number of calls is due, in your judgment, to the change from the party lines to single lines. A. Yes, sir.

Q. Have you formed any estimate or made any calculation as to the percentage of increase from that cause? A.
402 The statement filed (Defendant's Exhibit No. 16) gave the percentage of increase in calls, as compared with the percentage of increase of subscribers under those conditions between periods when there was in the first instance seventy per cent of our subscribers on party lines, and at a later period when there was but nineteen per cent on party lines.

Q. Between what years do you refer to now? A. I refer to the years 1887 and 1892.

Q. When did you begin to change from the party line system to the single line? A. I have not fixed the date definitely in my mind, but as near as I can recollect it was somewhere between 1890 and 1892.

Q. And how rapidly did you make the changes after that? How many changes did you make in each year after that, if you can give it, from the party line system to the single line? A. I have not fixed those things in my mind. I could make a statement of this kind on that point: For instance, in 1892 I have stated that nineteen per cent of the subscribers were on party lines; in 1893 there was 11 per cent, and for the four successive years ten per cent—bringing it down to 1897 inclusive.

Q. What was the percentage in 1891 and in 1890? A. In

1891 forty-five per cent of the subscribers were on party lines; in 1890, 54 per cent.

By Mr. HEMPHILL:

403 Q. What year was it you stated that there were such a large percentage of subscribers on party lines? A. In 1887 there was seventy per cent of the subscribers on party lines.

By Mr. BIRNEY:

Q. When was it that the operators were first charged with 100 subscribers only? A. In the year 1894 the number of subscribers was first reduced to 100 per operator.

Q. And it has remained at that number since that time? A. It has approximated that since that time; yes, sir.

Q. Your opinion that, if the switchboards were doubled, by doubling the list of subscribers that each operator could care for only one-half of the present number cared for is based, as I understand you, upon the theory that the number of calls per subscriber will increase by at least 100 per cent; am I right? A. Yes, sir.

Q. So that where you have now ten daily calls per subscriber, according to your theory there would be 20 daily calls per subscriber to cause the reduction in number of persons to be cared for by the single operator. A. Yes, sir; that is the idea.

Q. Upon a switchboard of 6,600 how many subscribers would each operator, according to your theory, care for? A. I
404 do not know that I should attempt to answer that offhand, without having time to make a calculation.

Q. Please make your calculation; I want it.

Witness was, by consent, given time to make the calculation called for, and to answer hereafter.

Q. Mr. Nevius, you have given us the average pay of the operating force, excluding only yourself, but including the assistant chief operator, a clerk, and the one supervising operator; will you now give me the pay to the female operators on the board, other than these three persons I have mentioned? A. I could make a statement to you embracing those persons, excluding myself, but embracing the others.

Q. You have already given it, omitting, I think, the pay of the clerk and supervising operator. Now what did you pay the operators on the switchboard? A. They are paid at different rates, from $4.17 up to $7.25 and $8.50 per week; they are graded, and vary. I was going to take out these three persons you mention, and give you the number of persons in the various grades.

Q. Well, give me those. A. There would be one operator at $8.50 a week.

Q. Is that the assistant operator of whom you have already spoken? A. No, sir; these are aside from those I have before mentioned.

Q. All right. Proceed. A. Three at $7.25 each per
405 week, two at $6.25, eleven at $5.75, three at $5.25, two at $4.75, seven at $4.17. There are two night operators receiving $7 each, and one night operator receiving $9.23.

Q. The night force consists of three persons? A. The all-night force.

BURNET L. NEVIUS, JR.

The cross-examination of this witness was here suspended temporarily, to be continued at a later time.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

JOSEPH E. CRANDALL, a witness heretofore examined, was recalled, and testified as follows:

By Mr. WORTHINGTON:

Q. In preparing the charts which are in evidence as exhibits 14 and 15 respectively, what, if any, allowance did you make for an increase in the number of calls per subscriber, when there is an increase in the number of subscribers? A. Not any at all.

Q. Assuming that when the number of subscribers is doubled the number of calls per subscriber is also doubled, have you made any chart which would illustrate the growth of the switchboard in that contingency? A. Yes, sir.

Witness here produces another chart, which counsel
406 for defendants offers in evidence, and the same is filed herewith marked Defendant's Exhibit No. 17.

Q. Do you wish to say anything in explanation of this chart just introduced? A. Yes, sir. The statement is somewhat in the rough, inasmuch as I was called to Rockville to-day on another legal matter, and not knowing what the average calls per telephone per day were, as has been stated by the chief operator, and it was impossible for me to go any further than the average of the present equipment, which I had inquired of him about, and which he worked out on that basis.

Q. On what basis. A. On the basis of the two charts Exhibits 14 and 15, not increasing the number of calls above ten per day per subscriber. My figures on those charts are worked out on that basis. The statement I made with reference to the number of calls per subscriber being doubled, and with refer-

ence to the equipment being doubled, while this last chart (Exhibit No. 17) is prepared showing the relative increase in switchboard equipment, and working on 20 calls per telephone per subscriber per day.

Q. In the case of 4,400 only? A. In the case of 4,400 only. If it should go to 6,600 I should still have to prepare a third chart.

Q. There is another matter concerning which I desire to question you, but which was overlooked by inadvertence when you were on the stand before. In addition to your duties in
407 charge of inside construction and equipment, have you anything to do with the outside plant of the company? A. Yes, sir.

Q. What is that? A. It comes under my duties as electrician of the company.

Q. What is it? A. As I explained last night, to test all the construction department cables, wires or any other electrical condition of the plant, relative to its electrical requirements or causes of depreciation or deterioration. That is all I have to do with the outside work.

Q. From your observation and experience in that line what can you tell us in reference to depreciation by electrolysis? A. It is a pretty big history, as the first appearance of it occurred in Washington, by our record here, in March, 1895. March, 1895, was when I got the first volt meter readings. That was determined by reason of the fact that we got big leakages indicated by noises, showing that the cables were interfered with by extraneous difficulties. Electrolysis was not entirely new to us, but we had not before that had anything to do with it in Washington. We had had it in Baltimore a little earlier. So I began a system of testing the sheaths of our outside cables, from January to March, 1895, those tests covering a period until fifteen days ago. We are constantly testing. Those tests are made on an average of every 60 days. There are
408 other conditions reported by the construction department, as per letters from Mr. Crenshaw that I have here, found by his cable inspector, who makes an external examination to see whether the sheath of the cable shows signs of decomposition. These tests are made at any time. When the reports are made to me by the superintendent of construction it becomes necessary to look into that particular cable. The correspondence shows the method of ascertaining whether the cable is electro-positive or electro-negative. If it is electro-positive that shows a dangerous condition of the cable. The trolley roads and the electric light currents and the three wire Edison system affect us by electrolytic action. In Washington the United States Electric Lighting Company has a neutral third wire which is very hard to keep clear. It is practically grounded. The moment that either side of the positive circuit

becomes grounded it makes a complete grounded circuit between the neutral and positive, and then we get electrolysis from the electric lighting system. That is not a very frequent occurrence. The principal electrolytic trouble is caused by single trolley of railroads, the system of returning the current by the tracks being practically a grounded system. These tests have been made all over Washington, and the leakages are great. While they are seeking a home at this particular time at the power house of the Potomac Electric and Power Company, the cables in the eastern section of the city are affected by the escaped current. That escaped current is due to
409 the fact that the railroad people fail to perfectly bond their tracks. In other words, while they are very particular to have a sufficient amount of copper overhead to take care of the output of their machinery for the delivery of their current to their motors on their cars, they attempt to bring that current back through the rails, sometimes through the proper sized rail, which is a 7-inch beam rail, at other times the rail is too small. The feed wires are copper, and the return is through the iron or steel rail, which in many cases is only bonded with the fish-plate between the two rails stud-bolted together. On the other hand, steel having about seven times the resistance of copper prevents the amount of current returning to its source of generation over its own path; it is forced, by very high resistance of the railroad joints and the fish-plates, to seek water pipes and gas pipes, but preferably lead cable, lead being a very fair conductor. In following either of the three metals mentioned after leaving its own conductor, due to extremely high resistance, it is forced to go some other path than its own direct path until there is a separation of one of the metals mentioned, or is deflected away from the straight path, the resistance increasing too greatly for the current to follow that conductor, and it takes a circuitous route, and after it leaves the cable or water pipe or gas pipe it jumps back to its own path. In making that jump galvanic action occurs and the lead simply sloughs off. The same thing would occur by chemical action. The tests, as numbers of them here
410 will show, show a majority of the company's cables to be in an electro-positive condition; that is, a condition in which they are taking on current from the railroad tracks and giving it up when the resistance increases too greatly at that point, resulting in the sloughing off of the lead sheaths covering the cable.

Q. What is the effect upon the cable at the point of sloughing off? A. If it keeps on at any one particular point of the cable, thirty days will eat a ½-inch cable sheath right through. The moment the lead, which is only used as a protection for the interior wires, is destroyed or eaten through by galvanic action,

the interior wires become exposed to water, their insulation resistance drops to nothing, and they are of no further use. While my reports to the superintendent of construction show that in certain localities extreme damage has been done, it is only shown at the manholes, the manholes being the only places where we can observe the action on the cables, the spaces between manholes being enclosed in ducts. We have been forced to pull out several pieces of cable, the cost of which the construction people have estimated; they have been pulled out as a consequence of my reports. But it is fair to say that the deterioration in the cables in Washington extends through the entire system. In fact, I suggested in one long report the necessity of bonding together every single cable in order to make it a part of the electric railway system. We attempted
411 to make our cables part of that system by connecting them all together and carrying them to the terminal point at Twenty-ninth and K streets, and there binding to an old railroad track belonging to the B. & O. Railroad Company. The lead sheath of that cable was measured to carry about 170 amperes of current, being about one-eighth of the output of the plant in Georgetown. That cable took care of the return for several months until their bonding became in worse shape than at the time this method was employed as a return. About a month or six weeks ago I was compelled to recommend, after making a long series of tests, which occurred at Thirty-sixth and G northwest, where the seat of the difficulty was, over at Thirty-first and Water streets, where the power house is located. I was compelled to recommend the construction department that we carry a zero copper wire from Twenty-ninth and K right to that power house, there to connect with the negative omnibus bar of their dynamo machine, which is part of their rail return. That forces us to run from our cable at Twenty-second and G as a return to Twenty-ninth and K, a zero copper wire and an additional zero wire besides the B. & O. railroad track up to the power house. Our tests there determined that we were bringing back a very much larger percentage of current than we were a year ago, which shows a worse condition in the manner of furnishing power of the Potomac Electric Light and Power Company. There is no doubt
412 in my mind but what the entire system of the Washington underground cables is in a large degree deteriorated by electrolytic action in places where we cannot see.

Q. You refer to the cables of the defendant company? A. Yes, sir; of the defendant company.

Q. From all you know of this subject and the best judgment you can give, what is the extent of this deterioration from electrolysis, averaging it for the entire system? In other words, about what might we expect to be the life-time of the cables under existing conditions?

Question objected to by counsel for complainants, since it appears from the statement of the witness that it would be pure speculation on his part.

A. I might say that there may be a number of cables inside of ducts between manholes that are just on the point of breaking. We have some samples here that show how the lead over the wire has suffered. We watch these things very closely, making volt meter readings. It takes only .01 of a volt discharge to cause galvanic action, and in some instances we got as much as 15 volts discharge, which would in thirty days destroy the best cable if it were not carried to the point of generation of the escaping current. At one time we thought we had it cured. We measured it and determined where the cable was affected by measuring the current. We traced that until we found where it was leaving the cable to go back to its natural source of generation. Then we figured how much current was escaping, and then supplied enough copper to take care of that immediate emergency. It might be compared to
413 a case of some bad blood disease, where the breaking out has been healed up; but when it is healed up in one spot you don't know but in 24 hours it will break out in another spot. So it is going on through the entire twenty-four hours, and may continue so long as there is a grounded trolley anywhere near an underground plant. This same condition applies to the water and gas pipes of the city.

Q. The question recurs, under existing conditions what, in your judgment, is the lifetime of these cables? A. Unless the difficulty is cured permanently many of the cables may not last, say 12 months longer, and we shall be called upon to pull out a thousand feet of cable at any time. If I could get in the duct between the manholes and see the condition of things I would know, but we cannot tell the condition only by means of electric tests.

Cross-examination.

By Mr. BIRNEY:

Q. Then you really have no means at present of telling how much of the cable is affected by electrolysis? A. No, sir; although I would like to say that we make periodical tests at our manholes in order to determine if troubles are existing.

Q. You have remedied the defects so far as you have discovered them? A. Yes, sir; we have cleaned it up to date;
414 we remedied the last known defect two weeks ago.

Q. Turn now to the chart which you have prepared, Defendant's Exhibit No. 17, did you prepare this yourself? A. That is the work of a draftsman; I made the rough of it myself.

Q. This appears to show that if the number of subscribers be increased from say 2,200 to 4,400 there will be a greater in-

crease in the size of the switchboard than double its present capacity? A. Yes.

Q. Will you explain how that can be? A. Yes, sir. On the basis of 2,200, if we were to double it to 4,400, assuming that we will double the number of calls per telephone, in figure one *a* represents present switchboard framework for 2,200 subscribers, as we are to-day; *b* represents keyboard equipment, that is, where the operators make their connections for answering and connecting subscribers; *c* represents present jack and answering equipment. Now follow figure 2; that represents the present number of multiple spring jacks. Will you allow me to say that *c* represents the answering jack equipment. There are two kinds of jacks. Figure 2 represents the multiple spring jacks. In Figure 3 *a* represents additional framework needed (shown in red), to be connected to the present framework, which is represented in blue; *b* represents additional keyboard equipments, which you will see in red, connected with the present keyboard equipment, which you notice in blue; *c* rep-
415 resents additional answering jack and drop equipment, in red, in connection with the present answering jack and drop equipment, in blue; *d* represents in dotted blue lines half of the present answering jack and drop equipment which would have to remain idle on the assumption that the calls per subscriber would be doubled. The notes relating to cost show that the present line capacity of our switchboard as it stands to-day is 2,200 lines; parts represented by Figure 1, namely, framework, keyboard, drops and answering jacks, costing $20,116.04; that is the present framework, keyboard drops and answering jacks. The conditions represented by Figure 2, namely, the 17,600 multiple spring jacks that are in use, show the cost of these things in our present equipment to be $13,936.23. These two sums added together make a total cost of the present 2,200, as given last night, to be $34,052.27. If doubling the number of subscribers' lines connected with the switchboard should double the number of subscribers' calls, then it would be necessary to halve the number of drops and answering jacks per operator, or to reduce the number from 100 to 50.

Q. Do you mean double the cost per subscriber? A. Per subscriber. That would be to halve the present number of drops the chief operator puts on his operators, which represents the number of calls per subscriber. This arrangement would give us the same number of calls per operator, that is, 50 drops on the 4,400 basis would give the same number of calls per subscriber, as his 100 drops, or whatever num-
416 ber of drops he places in the hands of each operator. To meet these conditions it will be necessary to add to the present switchboard—that is, to meet the 4,400 condition—three times the present framework and keyboard equipment at

a cost of $40,549.12, about three times as much as we have at present.

Q. I have not asked you as to the cost at all. You went over that in your previous examination. A. That was the cost as to that plan worked on that basis, working only on the average.

Q. I have not asked you as to the cost, though I do not object to it.

Mr. WOTHINGTON: You can finish your statement, and I will assume it as a further reply to a question I have put to you.

A. The framework, keyboards and that equipment would cost $40,548.12; 2,200 additional drops and answering jacks—double the number of drops we now have installed—and wire would cost $6,600. The additional multiple jacks on the basis of 20 calls per subscriber would be 123,200.

By Mr. BIRNEY:

Q. That is, with 4,400 subscribers? A. Yes, sir. Cable and labor connecting these jacks, with the cost of the multiple jacks themselves, would cost in all $97,553.61. There is brought forward for the cost of framework, &c., $47,148.12. To this we add 2,200 Hayes' protectors.

Q. State there what a protector is? A. A protector is
417 the medium of safety between the outside line and the switchboard drop at this end of the cable terminal, at the office end. It is part of the work which protects from storm or sneak currents; currents either of high or low potential we have to guard against, making the protectors cost $2,112; making a grand total, on the basis of 20 calls per telephone per subscriber, $146,813.73.

Q. Do I understand that that would be the additional cost of the new switchboard apparatus in case the number of subscribers were doubled, and at the same time the number of calls per subscriber were doubled? A. Yes, sir. That, of course, is added to the original cost of the switchboard, $34,000. In explanation I would like to offer that on account of doubling the number of calls per telephone, figuring on the same arrangement of the conditions of multiple spring jacks, it makes an increase of 8 to 1. Where we squared the number before we took the square of O is as to square R, so also is OJ to X, making the increase in charts 14 and 15 in the 4,400 about 4 to 1, while this present chart (Exhibit 17) that we now have shows that the increase of multiple spring jacks would be 7 times greater than the present number in the 2,200 capacity that we now have on the basis as explained by the chief operator.

By Mr. WORTHINGTON:

Q. Do you mean seven times added to the original? A. Yes, sir; which would make it 8 to 1.

By Mr. BIRNEY:

418 Q. The number of subscribers remaining the same, say 2,200, the number of calls per subscriber increasing, would the number of drops on your board increase? A. That would be determined by the number of calls an operator could handle. They could not increase above a certain amount per operator. If the number of subscribers is increased we have got to increase the drops.

Q. I now suggest the theory of increase in calls only, without an increase in the number of subscribers. A. That would not increase the number of drops.

Q. Would it increase the number of answering jacks? A. No, sir.

Q. Would it increase the multiple jacks? A. No, sir.

Q. What part of the switchboard equipment would be increased by multiplying the number of calls per subscriber without increasing the number of subscribers? A. We would be compelled to increase the capacity of the switchboard when the point was reached that the number of calls per operator per telephone was greater than the operator could handle. We would be compelled to increase the equipment for the reason that we have only three positions to a switchboard to be occupied by operators.

Q. What part of the switchboard equipment would be increased to meet that condition? A. No part unless the number of calls increased so rapidly that the operator could
419 not take care of 100 drops or even 50 drops. We would be compelled to stop taking subscribers.

Q. I have not suggested an increase in the number of subscribers. My question relates only to the increase in the number of calls, the number of subscribers remaining the same. A. We could not increase the number of calls above a certain proportion in the present switchboard. If that occurred we would have to increase every part of the switchboard.

Q. Do you know what that number would be? A. The number of calls an operator could handle?

Q. Yes. A. No; I have nothing to do with the arrangement of calls. But I should venture an opinion by saying—

Q. If you have no experience or knowledge I do not want your opinion. A. No experience in figuring the work handled by operators.

Q. Or the amount which an operator can handle? A. No, sir. If you will allow me, I know only on a complete equipment basis, on the number of drops handled per operator, which is based on the number of calls per telephone. The equipment planned by me was based on the number of drops provided for each operator after determining the number of calls.

Q. How many did you provide per operator in plan-

420 ning the present equipment of the defendant company? A. 100; only on the basis of 10 per subscriber.

Q. What do you mean by the framework? A. That represents the mahogany board, the iron framework, the keyboard, the panels, back and front, the legs, and the troughs through which the cables pass, or the part which holds the entire electrical equipment.

Q. Let me get a further explanation with regard to Figure 3, for example, of your chart Exhibit No. 17: What does A there represent? First, to make it clear, what does that figure represent? A. Fig. 1 represents the present switchboards as they now stand. In Figure 3 the letter A represents additional frame work needed; that is marked there in red; which is connected to the present framework marked there in blue.

Q. B represents what? A. B represents additional keyboard equipment, that is the framework on which the operators' equipment is mounted.

Q. Please explain once more how these additions come to be three times as great where the board is only doubled in size? A. The present equipment of the Company, 2,200 works 100 drops per operator. If the calls per subscriber double, we would be compelled to work only 50. Hence one-half of our present equipment would be idle, would be dead. We have got to duplicate that half some way or other to make it alive.

So it takes just as much equipment to duplicate what
421 we already have as the present equipment would be curtailed to. Consequently we would have to have another section of eight switchboards. Perhaps it would be plainer this way: In the 2,200 equipment we have 8 switchboard sections. To halve that or to kill half which would be necessary by doubling the number of calls, would make necessary another section of eight switchboards. So we have 16 sections of switchboard for 2,200 subscribers on the basis of 20 calls per day per subscriber, with 50 lines per operator instead of 100. Now to add another 1,100 would take a second 8 sections of switchboard, framework, keyboard equipment and all that. Then to get the remaining 1,100, making 4,400, it would require another eight sections. So we would have four 8-sections of switchboard for 4,400, instead of one as at present for 2,200.

Q. Will you explain why any part of your switchboard should be killed, as you term it, in this increase? A. Let me see if I cannot make that clear: we have 2,200 lines now in our present switchboard. That takes 8 sections of switchboard. That is the mechanical explanation. They show us that the average number of calls per subscriber is 10 per day. We can give an operator 100 lines on that basis. Now say we want to double our present equipment from 2,200 to 4,400. By

that ratio the number of calls per subscriber will double. We cannot put them in that 2,200 switchboard, nor can an operator in that 2,200 switchboard take care of 20 calls per subscriber per day on a 100 line, which would give her 2,000 calls a day, which she cannot handle. To keep us at the present
422 number of calls per day per subscriber we have got to halve the switchboard, reduce it from 100 drops to 50, so that one-half of that board would be left idle. Now we have got that 1,100 subscribers to be cared for. So we have got to duplicate that framework with its equipment that already exists in the 2,200 in another framework just the size of the present 2,200. If we did not increase our business we would not have to make any rearrangement of the switchboard on the basis of those Exhibits 14 and 15. But I have to follow the operating department; just in the ratio that they increase per call per telephone, I have to decrease my equipment per operator.

Q. That is, you theorize that that would be so? A. I figure it out that way.

Q. How much decrease, of which you speak, have you had in the past? Q. Up to date we have been fluctuating—this is from the chief operator's information given—from 110 or 115 to 100, but it has been very little over 100 subscribers per operator. As he increases the number of calls per subscriber he has to decrease the number of drops. It might go down to seventy or eighty.

By Mr. HEMPHILL:

Q. When you kill half the present number of drops, you say that you must increase your board to the same size as the present board? A. Yes, sir; on the basis of doubling our present equipment.

423 Q. Now what is the sense of increasing your board to double the size of the present board, when you proceed to kill half of the present board? A. We kill it because the equipment is already in it. It has been built.

Q. Why do you double it when you kill half the present board? A. I simply cannot get any more equipment in the frame work of those eight sections; and if the number of calls per subscriber doubles from ten to twenty I cannot furnish an operator with 100 lines; she has got to operate 50 lines. Now we have that 2,200 equipment on that board, and if we cannot operate it it must be left idle. We cannot be relieved of the responsibility of furnishing service to the 1,100 subscribers, but I cannot furnish it there, because the requirements have doubled. So we have got to duplicate the present eight sections to accommodate the 1,100 subscribers, when we don't get a single penny more. We have simply got to provide ways and

means to take care of the 1,100, and we cannot do it, because the number of calls per telephone per day has doubled, which means more than any human being can answer in one day.

Q. Then this whole thing is built up on the theory that doubling the number of subscribers will give you double the number of calls per subscriber? A. Yes, sir.

Q. And upon the further theory that you are going to
424 add to this switchboard, which was built for 100 drops, per operator, instead of building a new switchboard which would be constructed for 4,400? A. We would be worse off than that. I would rather leave half of it intact—

Q. I am asking about the theory. A. The theory would be to kill or leave idle the present equipment over and above the possibility of the operators handling it, because it would hardly pay to take it out; we could take out nothing but drops and answering jacks; the multiple jacks would have to remain.

Q. This cost is built up upon the basis of the present switchboard, is it? A. Yes, sir.

Q. And you figure it out that if you had 4,400 subscribers, your total cost would be something over $146,000? A. That is right; $146,813.73.

Q. That is how much per drop? A. We would have 4,400 drops.

Q. That would be something over $30 a drop? A. Yes, sir. By way of explaining my figures I would like to say that all switchboard equipment is based upon the number of calls answered per operator.

Q. Whether 4,400 will take twice as many as 2,200? A. As I said, that is on the basis that we would double, theorizing that we would double.

By Mr. WORTHINGTON:

Q. That you would double per subscriber? A. Yes,
425 sir.

By Mr. BIRNEY:

Q. Do you speak entirely from the information gained from the chief operator who has testified? A. Entirely from the testimony of the chief operator and other chief operators who watch the calls from the telephone; I do not watch the telephones.

Q. What other chief operators? A. Those in the service generally throughout different cities. I have been getting from them the average number of calls per telephone.

Q. Where have you gained such information, from whom, and in what cities? A. Principally in New York, in particular; I think they run there only 35 to 40 drops per operator.

Q. Do you know what the number is? A. I don't know exactly.

Q. When did you get your information there? A. Not since we put in the switchboards. I got that information when we were building the present equipment. I wanted to see how they run in other places and how we compared with them.

Q. Did you get information from any other place? A. No, sir; I think not. I made an average, and I have stated about the average.

J. E. CRANDALL.

Subscribed and sworn to before me, this 11th day of January, 1899.

Adjourned to 3.20 o'clock p. m. to-morrow Thursday, December 1, 1898.

JOHN W. HULSE,
Examiner in Chancery.

426 Washington, D. C., *December 1st*, 1898, 3.20 o'clock p. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. BIRNEY and Mr. HEMPHILL.

Present on behalf of the defendant, Mr. WORTHINGTON and Mr. WILSON.

HORACE W. UPPERMAN, a witness of lawful age, called by and on behalf of the defendant, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. Please state your age, Mr. Upperman? A. Thirty-seven.

Q. Where do you live? A. In Washington.

Q. What is your business at present? A. I am Secretary and purchasing agent of the Chesapeake and Potomac Telephone Company.

Q. How long have you held the position of purchasing agent for that Company? A. Since August 4, 1894.

Q. Were you connected with the Company before that? A. Yes, sir.

Q. In what way? A. I was secretary of the Company in March, 1894, and before that I held different positions, as clerk, etc.

427 Q. Since when? A. Since July, 1884.

Q. What salary do you receive? A. $2,100 per year.

Q. How long has that been your compensation? A. Since November, 1895.

Q. Prior to that what was your compensation? A. $1800 a year.

Q. For how long a period was your compensation $1800? A. I do not recall that.

Q. Was it so for several years? A. I have been paid different rates from $50 a month up to $2100 a year.

Q. Have you any subordinates under you? A. One.

Q. Who is that? A. H. D. Gasson.

Q. What duties does he perform? A. Well, he is doing the work of general clerk in my office.

Q. What compensation does he receive? A. $720 a year.

Q. Have you any other employes under you? A. No.

Q. What do you say as to the reasonableness of your assistants' salary? A. I should consider them perfectly reasonable.

Q. What do you say as to your ability to dismiss your
428 clerk and get along without him? A. I could not do it.

Q. Does the salary which you have stated as receiving include compensation for your services both as purchasing agent and as Secretary? A. Yes, sir.

Q. State in a general way what are your duties in your position as purchasing agent? A. To put it in a general way the duties consist in purchasing all materials used by the company.

Q. State in a general way the process that is gone through when the material is to be purchased by the Company. A. The process is about as follows: Before the meeting of the board of directors which appropriates the money to be expended during the coming month or the coming thirty days, an estimate is furnished me by the equipment department, and the construction department for materials which they think they will require, or presume they will require, during that period; prices are gotten on the different prices of material—

Q. Prices are gotten how, and from whom? A. From different dealers; usually by correspondence; as to purchasers in town they are gotten usually either by telephone or personal communication with the dealers by myself or my assistant. That estimate is made up and submitted to the General Manager, who goes over it with me, and sometimes it is subject to certain changes by him; finally it is approved by him and submitted to the Board of Directors and after their ap-
429 proval the purchase is made.

Q. All that has to be done before any purchase of material is made? A. Yes, sir; except in case of extreme emergency, and then that matter is submitted at the next meeting of the Board of Directors for their approval.

Q. State more fully what you mean by getting prices; when you get prices from different dealers, what do you do about it? A. I make the purchase from the lowest responsible bidder in all cases.

Q. Does the case ever arise when you have to purchase material and there is no competition? A. Only in case of articles that are patented or are controlled by certain companies.

Q. In that case what do you do? A. I correspond with them and find out the prices; in case the price given is higher than we have been in the habit of paying I find out the reason for that; such cases, however, very seldom occur. On the contrary, the prices are usually lower, and we get the benefit of any improvements in any patented article.

Q. What companies do you deal with principally, with reference to patented articles where there is no competition? A. We usually deal with the Western Electric Company.

Q. What is that, and where is its office? A. Their principal office, I believe, is in New York, but they have a
430 branch in Chicago, and two or three branches in Europe, I do not know exactly where, perhaps in Paris and London, but I will not be sure.

Q. What class of materials do you purchase from that company? A. We purchase bells, switchboard apparatus, cable and wire.

Q. Do you have any arrangement with that company with reference to what prices shall be paid, if the prices of goods go up or down before the goods are delivered? A. We made a contract with that Company as to wire, that in the event of the price of wire going up, they furnish us wire at the prices agreed upon, and in the event of a drop in prices they give us the advantage of it.

Q. Do you buy from that company any material except those articles covered by patents which it controls? A. Yes, sir.

Q. What classes of material? A. Wire is one article.

Q. What other? A. Mr. Worthington, I have prepared a statement showing the purchases for 1897, and that shows that there is about 24 per cent. of patented articles, and 66 per cent. of articles that were not patented.

Q. When you buy wire or other material from the Western Electric Company, which is not protected by patent, what do you do with reference to fixing the prices? A. I get prices from at least three or four people at any time for the
431 class of articles that I wish to purchase.

Q. With reference to purchases of that kind to which bidders do you give the contract? A. I give the contract to the lowest bidder right straight along, that is, provided it meets the approval of the Department using it. Of course the question of quality has to be taken into consideration.

Q. Do you pass upon that, or refer that to Mr. Crenshaw or Mr. Crandall? A. It is passed upon according to the departments to which the material goes.

Q. What can you tell us as to whether the company purchases any material which is not required to carry on its business? A. Not to my knowledge has it ever purchased anything that was not necessary.

Q. Do you have control of all purchases, or only a part of them that come under your immediate cognizance? A. Yes, sir; all of them.

Q. What would you say as to whether it is possible for the Company to purchase material or any of it, more economically than it does? A. If it were possible to find any better way of making purchases I would purchase in that way, but I simply follow the rule that has existed all along.

Q. What knowledge have you with regard to the waste or improper use of material purchased? A. I have no
432 knowledge at all; I have nothing to do with them beyond the purchase; that finishes my connection with it.

Q. What becomes of the material after it is purchased? A. It is turned over to the storekeeper, and he dispenses it upon approved requisitions through the superintendent of equipment and the superintendent of construction.

Q. How, with reference to the material when it is delivered here? A. The storekeeper receives it and certifies as to the quantity; and the superintendent of equipment and the superintendent of construction respectively, certifies to the quality.

Q. Who is the storekeeper? A. D. M. Steers.

Q. Where is that material kept while it is in charge of the storekeeper? A. Do you mean the location of it here in the city?

Q. Yes. A. That is kept at 1412 I street, part of it in the stable and part in the main building.

Q. I believe you have nothing to do with the care of the material after it is delivered to the storekeeper? A. Nothing whatever.

Q. Your duties cease when the material is purchased? A. Yes, sir.

433 Q. Is there any part of the material set up by the Company in the office or residence of a subscriber which does not belong to the Company? A. Yes, sir.

Q. What is that? A. The receiver and the transmitter.

Q. The receiver I believe is that part of the instrument which the operator puts to his ear when he is talking? A. Yes, sir.

Q. And the transmitter is that device into which he talks? A. Yes, sir.

Q. What else is it in the equipment of a subscriber's office or residence that the Company purchases and owns? A. The bell, backboard, battery and telephone cord and the wire necessary to go into the station.

Q. Do you have anything to do with the employment of labor? A. Nothing whatever.

Q. That is done by the heads of departments in which the labor is to be used? A. Yes, sir.

Q. What is done about keeping a record of the purchases? A. All the purchases are made by me upon an ordinary form of order to the Company, which I copy on a stub; that is, the city purchases are made on this form of order. In case of goods shipped to us from another city, when the in-
434 voice is sent me for the shipment, a record is made on the opposite showing the items ordered, and the items billed; then that invoice is sent to the storekeeper to be approved as to the quantity and to the respective superintendents as to quality; I approve it finally as to prices; and that passes into the Auditor's office for payment.

Q. Then the matter of keeping the proper record on the books of the Company depends entirely upon the bookkeeper in the auditor's office? A. Yes, sir; entirely. I keep a record of the order and the invoice.

Q. Then will your records show in detail every purchase mad of all the material, when, and how much was paid for in each particular class? A. Yes, sir.

Cross-examination.

By Mr. BIRNEY:

Q. Do you know the rental paid for the receiver and transmitter? A. Yes, sir.

Q. What is it? A. $7.50 per set per year.

Q. Is there one price only, or are there different classes for which different prices are paid? A. There are different classes.

Q. What are the prices of the different classes, and what are those classes? A. That I could not tell you, as to the
435 received rental for the instruments. I could look that up for you if you care for it. It is a sliding scale.

Mr. WORTHINGTON: We will furnish that. That has been called for by you, I think, heretofore, Mr. Birney.

HORACE W. UPPERMAN.

Sworn and subscribed to before me this 11th day of January, A. D. 1898.

JOHN W. HULSE,
Examiner in Chancery.

BURNET L. NEVIUS, Jr., recalled for further cross-examination.

By Mr. BIRNEY:

Q. Mr. Nevius, are you now prepared to answer the question which I asked you, as to the number of subscribers in your opinion, that may be cared for by one operator, if the switchboard were increased to the capacity of 6,600? A. Yes,

sir. With the total number of subscribers at 6,600 the number of calls per subscriber being 30 per day, the number of subscribers an operator could take care of would be 33 1-3.

Q. And on a board of 8,000? A. On a board of 8,000 the number of calls per subscriber being 36.31 per day, the number of lines or subscribers to an operator would be 27½.

436 Q. And a board of 8,800. A. With a board of 8,800, at the rate of 40 calls per day per station, the number of subscribers would be 25 per operator's position.

Q. Those would be the probable results, in your opinion? A. Yes, sir.

Q. You think that if the switchboard were increased to 6,600 drops the number of calls per day to each subscriber would average 30? A. Thirty, as I have just stated.

Q. Upon what principle have you reached this conclusion? A. It is based on the principle that as the total number of subscribers is doubled the rate of calls per subscriber is doubled.

Q. Are you yourself acquainted with the sizes of the large switchboards in use in the country at other exchanges? A. I cannot say that I am.

Q. Do you know what is the largest sized switchboard in actual use in the country? A. No, sir; I do not.

Q. You have made no inquiry along that line? A. No, sir.

Q. Have you kept any record as to any particular subscriber or subscribers which will show the increase in the number of different persons called by such subscriber or sub-

437 scribers in different years? A. No, sir.

Q. So you have no means of telling whether the number of persons called by one subscriber, say in 1890, was increased in 1897? A. I have never kept any record with that end in view. These figures are based upon the principle I have just stated as demonstrated by the records or exhibits filed yesterday evening.

Q. Those figures have no reference whatever to the question I have just asked you. You haven't kept any record of the identity of the persons called by any subscriber? A. No, sir.

Q. Are you able to tell us now the days in any year upon which you made the peg count referred to in your former testimony? A. Yes, sir.

Q. In what years, and what were they? A. I find that peg counts were taken seventeen times during the year 1894; thirty-five during 1895; 27 during 1896; 21 during 1897. The dates upon which these averages were taken were November 26 and 28, 1894; December 7, 1895, and December 23, 1895; February 18, 1896, and March 10 and 11, 1896; January 29 and February 18, in 1897. I would state that in each of these years there was a maximum number of daily calls exceeding the number of calls under either of these dates.

438 Q. When? A. In each of those years. The first was in December, 1895; the next in February, 1896, and in April, 1897, during the month of January. My object in getting the average calls was not so much to get it at the number of days running through the different months of the year as it was to discover any day in the year upon which the average number of calls per subscriber was of the number given. In other words, if the average number of calls per subscriber upon any day of the year were that high several times in the year it would be necessary to provide the operating force accordingly. I have here, and hand to counsel for complainants, a statement giving the dates on which the peg accounts were made, which I have used in making my averages, and this paper shows also the aggregate number of calls on each of those dates.

Q. On what principle did you select these dates for your averages? A. I selected them with a view to having a test that would show approximately the high number of calls.

Q. Can you state the minimum number of calls that you found on any one of these peg counts? A. Yes, sir; the number of calls in all these four years mentioned when peg counts were made, was in the month of August, 1897, when the number of calls reached as low as 12,260.

Q. What was the minimum number in 1894, on any peg count day? A. The minimum number of calls in that
439 year upon days when peg counts were taken, was 12,421, also occurring in the month of August.

Q. Give 1895? A. The minimum number of calls on peg count days occurred in July, the number being 13,149.

Q. Now take 1896? A. In 1896, on peg count days the minimum occurred in the month of July, the number being 13,421.

Q. In 1897? A. I have already stated that the first and lowest one of the entire number was in the month of August. That was 12,260.

Q. How far back of 1894 have you gone in your examination? A. My peg count record does not go back of 1890—that method of keeping the record; and I have no records in my department on my files giving the number of calls, although the records were made at least once a year and reported to the Secretary of the Company as far back as 1885. I had not the calls for 1884, and they were not mentioned in the estimate I made on the basis of calls, on that account. There was no record I could find of 1884.

Q. Have you made up the statement of the number of calls on peg count days, which have gone into your average statement prior to 1884? A. I have made no statement in that way. I simply had the rate of calls per subscriber; I did not carry it out into totals for the number of subscribers in those times.

440 Q. Will you now give us the dates, and the aggregate number of calls on each day when you took peg count, which entered into your average? A. November 26, 1894, the aggregate calls taken by peg counts were 16,721; November 28, 1894, the aggregate calls by peg counts were 19,672; in 1895, on December 7th, the number of calls taken by peg count was 18,274; December 23, 1895, the number of calls on peg counts was 20,192; in 1896, February 18, the number of calls on peg counts was 18,978; March 10, 1896, the number of calls on peg counts was 18,896; March 11, 1896, the number of calls on peg counts was 19,358; in 1897, January 29, the number of calls on peg counts was 19,508; February 18, 1897, the number of calls on peg counts was 18,382.

Q. What sort of record, if any, of this kind did you keep between 1890 and 1894? A. I have some such records; we have the peg count record, so far as I recall.

Q. Can you tell us how many months in each year or years, between 1890 and 1894, you made peg counts? A. I cannot say that I do recall; I could not recall about that when I was on the stand before, without looking it up. But upon looking over the record I find that it was very extensive throughout the years you inquired about them.

Q. How many times did you make the counts? A. On perhaps a dozen or eighteen days, something like that.

By Mr. WORTHINGTON:

441 Q. Consecutively or scattered throughout the year? A. Scattered along.

By Mr. BIRNEY:

Q. Can you not speak more definitely than that? A. No, sir; not at this time. I did not go into that record particularly. It was this later record which you asked about pointedly, and I made the record giving dates for the whole thing, as required.

Q. What records, if any, or counts, have you prepared prior to 1890? A. I think I stated a few moments ago that I had no peg count records in my department back of that date.

Q. Were any peg counts made in those years, so far as you have knowledge? A. Records were taken, but not by peg counts.

Q. How were they taken? A. By piece of pencil and paper.

Q. What became of those counts? Was a record of them made and preserved? A. The rate of calls per subscriber in those years was taken and reported to the Secretary of the company; those records were made at the request of the secretary.

Q. What had you to do with the counts, if anything, in those years? A. I simply had to see that the request was complied with.

Q. What was your position in the operating room at
442 that time? A. Chief operator.

Q. Do you know how frequently in those years these counts were made? A. I do not recall exactly, no, sir.

Redirect examination.

By Mr. WORTHINGTON:

Q. There is a matter about which I wish to ask you, which is perhaps clear enough on the record already, but I will ask you to explain it: You state that the number of subscribers per operator is now 100. It appears that you have about 2,200 subscribers, but that the number of operators is 35, which would make 13 more operators than the ratio which you have stated would call for. How is that explained? A. This ratio here spoken of as 22 operator positions on the switchboard is the number required to be filled always during the busy hours of the day, and during those hours there would be required a certain number of operators who would work perhaps for a term of eight hours at the boards, and when their term expires they have to be replaced by others who work at other hours, day or night.

Q. What are the hours during which the women operators have charge of the switchboard? A. We have lady operators on duty from 7 a. m. until 10 p. m.

Q. And between those hours, during the night, you
443 have three men to watch the board? A. Yes, sir.

Q. You do not keep all the day operators at work from 7 a. m. until 10 at night? A. Oh, no, of course not. The exact period for each of the lady operator's daily service is eight hours.

BURNET L. NEVIUS, JR.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

DANIEL MARION STEERS, a witness of lawful age, called by and on behalf of the defendant, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. What is your age, please? A. I am twenty-seven years old.

Q. Do you reside in Washington? A. Yes, sir.

Q. Are you connected with the Chesapeake & Potomac Telephone Company now? A. Yes, sir.

Q. In what way? A. I am a storekeeper.

Q. How long have you been storekeeper? A. A year last month.

Q. Who was your predecessor? A. I don't think I had any predecessor.

Q. Who performed the duties of the position, do you know? A. I don't know exactly.

444 Q. Where is the place where you keep the stores of which you have charge? A. 1412 I street northwest.

Q. Have you any subordinates or employees? A. I have two subordinates.

Q. Who are they, and what do they do? A. One is my assistant in the construction department, and the other is my assistant in the electrical department.

Q. What compensation do you receive? A. $720 a year.

Q. What compensation do your two assistants receive? A. The one in the construction department gets $50 a month, and the one in the electrical department gets $28 a month.

Q. What is your judgment as to whether those salaries are excessive? A. I don't think they are excessive.

Q. We would like to know whether the work that you have would enable you to dispense with either of these assistants? A. No, sir.

Q. Are you all kept reasonably busy? A. We are kept very busy, indeed.

Q. In a general way what are your duties? A. Well, my duties are these: When requisitions are made on me by the heads of the various departments I have to approve them and see that my assistant gets out the material, the weights,

445 &c., and then checks them afterwards, and then keep an ordinary set of books—a receiving book and ledger and that sort of thing, and that is about the extent of my duty.

Q. Do your books show all the material that comes to you and all that goes out? A. Yes, sir.

Q. In what way, if at all, is the company enabled to hold you accountable for what material you received? A. I am under bond.

Q. What bond do you give? A. $2,000.

Q. In what way does the company know what material you have received? A. The bills are checked by the heads of the various departments as to quality; I check them as to quantity, and the purchasing agent checks them as to prices.

Q. Where are these bills retained after you have checked them as to quantity? A. Then they go back to the auditing office, I believe.

Q. Then that office holds the bills checked by you, which show that you have received the articles specified on the bills? A. Yes, sir.

Q. When material goes out from the storehouse, what is the process? A. Requisitions are made on me by the heads of various departments—

446 Q. In writing? A. In writing, and are signed either by the heads of the departments or by people accredited by them to sign.

Q. When you honor the requisitions what becomes of them? Do you retain them, or do they go back to the proper office of the company? A. They go back to the auditing office. In the first place they make requisition on me with a temporary receipt which I hold until they are enabled to report to me as to the disposition of the article; part of the material is of course returned; and then they summarize this in a report of material used. That is posted in the permanent ledger, and it then goes back and is filed in the auditor's office.

Q. So that they have that to show what material has gone out? A. Exactly.

Q. That, perhaps, sufficiently explains the matter, but I will ask you if any material of which you have charge could disappear in a proper way without the company knowing it? A. No, it cannot.

Q. Then if it should disappear in any improper way you could be held responsible? A. Of course I could be held responsible; yes, sir.

Q. Let me ask you a question which, perhaps, as a matter of fact I ought not to ask you: Whether there is any im-
447 proper disappearance or waste of material from your department? A. Absolutely none.

Cross-examination.

By Mr. BIRNEY:

Q. What is the quantity of material which you usually keep on hand? A. I do not know the exact figures, but our last inventory was in the neighborhood of $25,000.

Q. Is that a fair average? A. I have not been with the company long enough to answer that.

Q. Is that a fair average for the time that you have been in charge of the stores? A. I think so.

D. M. STEERS.

Subscribed and sworn to before me this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

SAMUEL M. BRYAN, recalled for further cross-examination.

By Mr. WORTHINGTON:

Q. Have you now the statement which was called for by counsel for complainants as to the number of Government telephones in use in 1897 and down to October 31, 1898? A. I have.

448 Witness produces a statement containing, first, the number of Government telephones installed or disconnected from January 1 to December 31, 1897, with the rates for each, character of service, and in which department building located or connected, and containing also separately the same information covering the period from January 1 to October 31, 1898, and this statement counsel for defendant now hands to counsel for the complainants.

Cross-examination.

By Mr. BIRNEY:

Q. Can you now state, looking at the statement which you have prepared, how many Government telephones were installed from January 1, 1897, down to October 31, 1898?

Counsel for defendant object to the witness being cross-examined on this paper unless it is put in evidence.

Counsel for complainants amend the question by asking this question:

Q. Can you now state the number of telephones installed for the Government in the District of Columbia, between the first day of January, 1897, and the 31st of October, 1898? A. I cannot give the number without going over that paper.

Q. Will you please inform yourself by such material as is within your reach?

449 Counsel for complainants here hands the paper referred to to the witness. Whereupon counsel for defendant offer the paper in evidence, and it is herewith filed, marked Defendant's Exhibit No. 18, and is in the words and figures following, to wit:

450 *Number of Government Telephones, installed or discontinued, from January 1st to December 31st, 1897, with rates for each, character of service, and in which Department building located, or connected.*

CONNECTED.

No. of Stations.	Building in which located, or with which connected.	Character of service.	Rate per station.
1	Fort Myer.....	Ext. Station.....	100.00
1	Bureau of American Republics.	One-party Met. Cir....	140.00
1	U. S. Senate.....	Auto. Pay Station....	Tolls
1	House of Representatives	One-party Met. Cir....	145.00
1	Navy Yard.....	Swbd. grounded.....	60.00
1	District of Columbia.....	Grounded	87.50
1	National Museum.....	Switchboard	25.00

Defendant's Exhibit No. 18.—Continued.

No. of Stations	Building in which located, or with which connected.	Character of service.	Rate per station.
1	War Department.....	Grounded	78.25
1	Executive Mansion.....	One-party Met. Cir....	125.00
1	Executive Mansion.....	Ext. Station.....	50.00
1	Bureau of American Republics.	One-party Met. Cir...	146.00
2	District of Columbia.....	Grounded	50.00
1	Post Office Department..	One-party Met. Cir...	125.00
1	Post Office Department..	One-party Met. Cir...	110.00
1	National Museum.....	Grounded	97.00
1	Treasury Department....	Grounded	80.00
1	Interior Department.....	One-party Met. Cir...	140.00
20	U. S. Senate.....	Switchboard	45.00
1	U. S. Senate.....	One-party Met. Cir...	110.00
450½			
1	Building for Library of Congress.	One-party Met. Cir...	145.00
3	Washington City Post Office.	One-party Met. Cir...	92.00
2	Washington City Post Office.	One-party Met. Cir...	122.00
1	Washington City Post Office.	One-party Met. Cir...	112.00
1	Washington City Post Office.	One-party Met. Cir...	142.00
2	U. S. Senate.....	Switchboard	45.00
1	National Museum.....	Switchboard	85.00
1	National Museum.....	Switchboard	45.00
1	District of Columbia.....	One-party Met. Cir...	125.00
1	Government Printing Office.	Swdb. grounded.....	60.00
1	Bureau of American Republics.	One-party Met. Cir...	141.00
1	Washington City Post Office.	One-party Met. Cir...	125.00
1	Washington City Post Office.	One-party Met. Cir...	125.00
1	Washington City Post Office.	One-party Met. Cir...	155.00
1	Post Office Department..	One-party Met. Cir...	150.00
1	Recorder of Deeds.....	Grounded	100.00
1	District of Columbia.....	One-party Met. Cir...	125.00

Defendant's Exhibit No. 18.—Continued.

No. of Stations	Building in which located, or with which connected.	Character of service.	Rate per station.
1	District of Columbia.....	One-party Met. Cir...	50.00
1	District of Columbia.....	One-party Met. Cir...	125.00
1	District of Columbia.....	One-party Met. Cir...	50.00
1	Government Printing Office.	Grounded	110.50
451			
1	District of Columbia....	Grounded	50.00
1	Interior Department.....	One-party Met. Cir...	140.00
25	Post Office Department..	Switchboard	72.00
11	Post Office Department..	Switchboard	48.00
3	Post Office Department..	Switchboard	58.00
1	Post Office Department..	Switchboard	68.00
1	Department of Justice...	One-party Met. Cir...	120.00
1	Recorder of Deeds.....	Grounded	100.00
1	Naval Observatory.....	One-party Met. Cir...	194.00
2	Post Office Department..	One-party Met. Cir...	135.00
1	Register of Wills.....	One-party Met. Cir...	125.00
25	Treasury Department....	Switchboard	48.50
15	Treasury Department....	Switchboard	34.50
2	Treasury Department....	Switchboard	44.50
2	Treasury Department....	Switchboard	54.50
1	Treasury Department....	Switchboard	74.50
1	Treasury Department....	Switchboard	94.50
1	Treasury Department....	One-party Met. Cir...	140.00
1	War Department.....	One-party Met. Cir...	100.00
1	Treasury Department....	Switchboard	34.50
1	Treasury Department....	Switchboard	34.50
1	Treasury Department....	Switchboard	84.50
1	War Department.....	One-party Met. Cir...	100.00
1	Department of Agriculture.	One-party Met. Cir...	130.00
1	Department of Agriculture.	Gen. Metallic Cir.....	100.00
1	War Department.....	Grounded	72.00
1	Interior Department.....	One-party Met. Cir...	110.00
452			
1	Bureau of Engraving and Printing.	One-party Met. Cir...	131.00
1	Department of Justice...	One-party Met. Cir...	125.00

Defendant's Exhibit No. 18.—Continued.

No. of Stations.	Building in which located, or with which connected.	Character of service	Rate per station.
1	Department of Justice...	Ext. Station.....	36.00
3	Building for Library of Congress.	One-party Met. Cir...	145.00
1	U. S. Attorney for D. of C.	One-party Met. Cir...	135.00
25	Government Printing Office.	Switchboard	72.00
5	Government Printing Office.	Switchboard	40.00
1	Government Printing Office.	Switchboard	50.00
1	Government Printing Office.	Switchboard	60.00
1	Government Printing Office.	Switchboard	70.00
3	Government Printing Office.	Switchboard	80.00
1	Government Printing Office.	Switchboard	100.00
1	Government Printing Office.	Switchboard	120.00
1	District of Columbia....	Grounded	50.00
1	War Department.....	One-party Met. Cir...	135.00
1	War Department.....	Ext. Station.....	45.00
1	War Department.....	One-party Met. Cir...	125.00
1	Post Office Department..	One-party Met. Cir...	120.00
1	District of Columbia.....	Grounded	50.00
1	Department of Justice...	One-party Met. Cir...	125.00
1	Army Headquarters.....	One-party Met. Cir...	125.00
1	Department of Agriculture.	One-party Met. Cir...	135.00
1	Post Office Department..	One-party Met. Cir...	120.00
1	Treasury Department....	Gen. Metallic Cir.....	160.00
453	DISCONNECTED.		
1	Inter-Continental Railway Com.	Grounded	72.00
1	War Department.....	Grounded	60.00
1	Bureau of American Republics.	Grounded	100.00
1	Venezuelan Boundary Commission.	One-party Met. Cir...	146.00

Defendant's Exhibit No. 18.—Continued.

No. of Stations	Building in which located, or with which connected.	Character of service.	Rate per station.
1	Treasury Department....	Grounded	80.00
1	Department of Justice...	One-party Met. Cir...	100.00
1	Department of State....	Grounded	72.00
1	Executive Mansion.....	One-party Met. Cir...	125.00
1	Bureau of American Republics.	One-party Met. Cir...	140.00
1	Post Office Department..	Grounded	72.00
1	Interior Department.....	Grounded	78.00
1	House of Representatives	Grounded	117.50
1	Interior Department.....	Swbd. grounded.....	60.00
1	U. S. Senate.....	One-party Met. Cir...	150.00
1	U. S. Senate.....	Grounded	92.00
1	U. S. Senate.....	Grounded	112.50
1	U. S. Senate.....	One-party Met. Cir...	225.00
1	U. S. Senate.....	Grounded	112.50
1	Building for Library of Congress.	Grounded	80.00
1	War Department.....	Grounded	72.00
1	Bureau of American Republics.	One-party Met. Cir...	146.00
1	Treasury Department....	Grounded	80.00
2	Washington City Post Office.	One-party Met. Cir...	92.00
1	Washington City Post Office.	One-party Met. Cir...	122.00
1	U. S. Senate.....	One-party Met. Cir...	110.00
1	Post Office Department..	Grounded	80.00
1	District of Columbia....	Grounded	50.00
454			
1	District of Columbia....	Grounded	50.00
1	District of Columbia....	One-party Met. Cir...	125.00
1	District of Columbia....	Grounded	50.00
1	District of Columbia....	Grounded	50.00
1	Government Printing Office.	Swbd. grounded.....	100.00
1	Interior Department.....	One-party Met. Cir...	140.00
1	Post Office Department..	One-party Met. Cir...	125.00
1	Post Office Department..	One-party Met. Cir...	140.00
1	Post Office Department..	One-party Met. Cir...	140.00
5	Post Office Department..	Grounded	80.00
1	Register of Wills.....	Grounded	100.00

Defendant's Exhibit No. 18.—Continued.

No. of Stations.	Building in which located, or with which connected.	Character of service.	Rate per station.
1	Naval Observatory.....	Grounded	140.00
1	Treasury Department....	One-party Met. Cir...	140.00
12	Treasury Department....	Grounded	80.00
1	Treasury Department....	Grounded	112.50
1	Treasury Department....	Gen. Metallic Cir....	160.00
1	Department of Agriculture.	Grounded	148.75
1	Army Headquarters.....	Grounded	72.00
1	Bureau of Engraving and Printing.	Grounded	106.00
1	Department of Justice...	Grounded	80.00
1	U. S. Attorney for D. C..	Grounded	100.00
11	Government Printing Office.	Grounded Swbd.....	60.00
1	Government Printing Office.	Grounded Swbd.....	60.00
3	Government Printing Office.	Grounded	100.00
1	Government Printing Office.	Grounded	112.50
455			
2	War Department.....	Grounded	80.00
1	Post Office Department..	One-party Met. Cir...	110.00
1	Army Headquarters.....	Grounded	60.00
1	Congressional Library...	Grounded	72.00
1	Weather Bureau.....	Grounded	100.00

456 *Number of Government Telephones, installed or disconnected, from January 1st to October 1st, 1898, with rates for each, character of service, and in which Department building located or connected.*

CONNECTED.

No. of Stations.	Building in which located, or with which connected.	Character of service.	Rate per station.
17	Building for Library of Congress.	Switchboard	52.625
1	U. S. Senate.....	Switchboard	45.00
1	U. S. Senate.....	Switchboard	45.00

Defendant's Exhibit No. 18.—Continued.

No. of Stations	Building in which located, or with which connected.	Character of service.	Rate per station.
1	Department of State....	One-party Met. Cir..	100.00
1	Treasury Department....	Switchboard	104.50
1	Treasury Department....	Switchboard	114.50
1	U. S. Senate.....	Switchboard	45.00
2	Building for Congress...	Switchboard	52.625
1	U. S. Senate.....	Switchboard	36.00
1	National Museum.....	Switchboard	25.00
1	U. S. Attorney for D. C..	Ext. Station.....	36.00
1	U. S. Senate.....	One-party Met. Cir..	145.00
1	District of Columbia....	Grounded	112.25
1	Washington City Post Office.	Ext. Station.....	36.00
1	Navy Department.....	One-party Met. Cir..	125.00
1	U. S. Senate.....	One-party Met. Cir..	145.00
1	House of Representatives	Ext. Station.....	36.00
1	War Department.....	One-party Met. Cir..	105.00
1	War Department.....	One-party Met. Cir..	110.00
1	U. S. Senate.....	Switchboard	36.00
1	Treasury Department....	Switchboard	94.50
1	Treasury Department....	Switchboard	84.50
1	Interstate Commerce Commission.	One-party Met. Cir..	125.00
1	Interstate Commerce Commission.	Ext. Station.....	36.00
1	Navy Department.....	One-party Met. Cir..	125.00
1	U. S. Engineer's Office...	One-party Met. Cir..	125.00
1	Bureau of American Republics.	One-party Met. Cir..	135.00
1	Department of State....	One-party Met. Cir..	125.00
1	U. S. Marine Corps.....	Grounded	137.50
1	War Department.....	One-party Met. Cir..	135.00
457			
1	Treasury Department....	Switchboard	64.50
1	District of Columbia....	One-party Met. Cir..	125.00
1	Navy Department.....	One-party Met. Cir..	125.00
1	War Department.....	One-party Met. Cir..	125.00
1	Department of Agriculture.	One-party Met. Cir..	66.00
1	Department of Agriculture.	Ext. Station.....	36.00
1	Navy Department.....	One-party Met. Cir..	135.00

Defendant's Exhibit No. 18.—Continued.

No. of Stations.	Building in which located, or with which connected.	Character of service.	Rate per station.
1	War Department.....	One-party Met. Cir..	125.00
1	Executive Mansion.....	Ext. Station.....	50.00
2	Department of Agriculture.	One-party Met. Cir..	60.00
1	U. S. Senate.....	Switchboard	36.00
1	War Department.....	One-party Met. Cir..	215.00
1	War Department.....	One-party Met. Cir..	135.00
1	War Department.....	One-party Met. Cir..	110.00
1	Government Printing Office.	Switchboard	120.00
1	District of Columbia....	One-party Met. Cir..	50.00
1	War Department.....	One-party Met. Cir..	125.00
1	U. S. Senate.....	Switchboard	86.00
458			
1	National Museum.....	Switchboard	25.00
1	War Department.....	One-party Met. Cir..	145.00
1	War Department.....	Gen. Metallic Cir....	208.00
1	War Department.....	Ext. Station.....	70.00
1	War Department.....	One-party Met. Cir..	135.00
1	War Department.....	Ext. Station.....	36.00
1	Department of Interior..	One-party Met. Cir..	135.00
1	Treasury Department....	Switchboard	74.50
1	U. S. Senate.....	Switchboard	36.00
1	U. S. Senate.....	Switchboard	36.00
1	Department of Agriculture.	One-party Met. Cir..	300.00
48	House of Representatives	Switchboard	40.50
1	House of Representatives	Switchboard	140.50
1	House of Representatives	Switchboard	160.50
1	Treasury Department....	Switchboard	74.50
1	War Department.....	Grounded	72.00
1	War Department.....	One-party Met. Cir..	125.00
9	Department of Agriculture.	Switchboard	110.00
3	Department of Agriculture.	Switchboard	120.00
2	Department of Agriculture.	Switchboard	40.00
1	District of Columbia....	One-party Met. Cir..	140.00
1	Government Hospital for the Insane.	One-party Met. Cir..	500.00

Defendant's Exhibit No. 18.—Continued.

No. of Stations.	Building in which located, or with which connected.	Character of service.	Rate per station.
1	Post Office Department..	Switchboard	40.00
1	Treasury Department....	Ext. Station.....	36.00
1	War Department.....	One-party Met. Cir..	135.00
4	Navy Yard.....	Switchboard	70.00
459			
1	Navy Yard.....	Switchboard	Tolls
1	Treasury Department....	Ext. Station.....	36.00
1	War Department.....	One-party Met. Cir..	125.00
1	District of Columbia....	Grounded	60.00
1	War Department.....	One-party Met. Cir..	125.00
1	District of Columbia....	One-party Met. Cir..	135.00
1	District of Columbia....	One-party Met. Cir..	110.00
1	Treasury Department....	Gen. Metallic Cir....	160.00
1	Treasury Department....	Switchboard	134.50
1	War Department.....	One-party Met. Cir..	135.00
1	District of Columbia....	Grounded	60.00
1	Navy Yard.....	Switchboard	70.00
1	Treasury Department....	Switchboard	124.50
1	Treasury Department....	One-party Met. Cir..	66.00
1	House of Representatives	Switchboard	40.50
1	War Department.....	Grounded	100.00
6	War Department.....	Switchboard	100.00
1	Interior Department....	Swbd. Grounded....	85.00
1	National Museum.....	Switchboard	45.00
1	U. S. Senate.....	Switchboard	36.00
1	Treasury Department....	Switchboard	64.50
1	Treasury Department....	Switchboard	34.50
1	Treasury Department....	Switchboard	74.50
1	Treasury Department....	Switchboard	34.50
1	War Department.....	One-party Met. Cir..	125.00
1	War Department.....	Grounded	72.00
460			
1	Treasury Department....	Switchboard	74.50
1	District of Columbia....	Grounded	68.75
1	Treasury Department....	Switchboard	34.50
461	DISCONNECTED.		
4	Building for Library of Congress.	One-party Met. Cir..	145.00

Defendant's Exhibit No. 18.—Continued.

No. of Stations.	Building in which located, or with which connected.	Character of service.	Rate per station.
1	Department of Justice...	One-party Met. Cir..	120.00
1	War Department.....	One-party Met. Cir..	115.00
1	War Department.....	Grounded	72.00
1	Treasury Department....	One-party Met. Cir..	140.00
1	U. S. Coast and Geodetic Survey.	Grounded	100.00
1	Interstate Commerce Commission.	One-party Met. Cir..	140.00
1	Navy Department.....	Grounded	100.00
1	U. S. Engineer's Office...	Grounded	100.00
1	Bureau of American Republics.	One-party Met. Cir..	141.00
1	Department of State....	Grounded	60.00
1	Bureau of Engraving and Printing.	One-party Met. Cir..	131.00
1	War Department.....	Grounded	60.00
1	Bureau of Engraving and Printing.	Grounded	72.00
2	Department of Agriculture.	Grounded	60.00
1	District of Columbia....	Grounded	50.00
1	War Department.....	Grounded	80.00
1	District of Columbia....	Grounded	50.00
1	War Department.....	Grounded	80.00
1	District of Columbia....	One-party Met. Cir..	50.00
1	Department of Agriculture.	Gen. Metallic Cir....	100.00
3	House of Representatives	Grounded	112.50
3	House of Representatives	Grounded	100.00
1	House of Representatives	Grounded	60.00
1	War Department.....	Grounded	60.00
462			
1	War Department.....	Grounded	78.00
1	Washington Aqueduct Office.	2-party Grounded...	86.25
2	Department of Agriculture.	One-party Met. Cir..	60.00
3	Navy Yard.....	Swbd. Grounded....	60.00
1	Navy Yard.....	Swbd. Grounded....	100.00
1	Navy Yard.....	Swbd. Grounded....	125.00
1	District of Columbia....	Grounded	65.00

Defendant's Exhibit No. 18.—Continued.

No. of Stations	Building in which located, or with which connected	Character of service.	Rate per station.
1	War Department.....	Grounded	78.25
1	War Department.....	Grounded	80.00
1	Navy Yard.....	Swbd. Grounded....	Tolls
1	District of Columbia....	One-party Met. Cir..	125.00
1	Department of State....	One-party Met. Cir..	100.00
1	Treasury Department....	Switchboard	74.50
1	Treasury Department....	Switchboard	84.50
1	District of Columbia....	Grounded	87.50
1	National Museum.....	Switchboard	85.00
1	War Department.....	One-party Met. Cir..	125.00
1	Navy Department.....	One-party Met. Cir..	135.00
1	War Department.....	Gen. Metallic Cir....	208.00
1	Treasury Department....	Gen. Metallic Cir....	160.00
1	Post Office Department..	One-party Met. Cir..	120.00

463 By Mr. WORTHINGTON:

Q. Does that paper contain the information which Mr. Birney has just asked of you, and the information which he called for some days ago? A. It does.

Q. And which your assistants have been compiling in the meantime? A. Yes, sir.

By Mr. BIRNEY:

Q. How many free telephones are there in the District of Columbia? A. I am not able to answer that question at this time.

Q. Have you at any time during the present year made an enumeration? A. I do not remember now whether I have or not.

Q. Did you not do so last spring when testifying before the House committee? A. I made some inquiries on that point, but I do not think that I made any list or prepared any register of free telephones.

Q. Did you not testify before that committee that the number then was 59? A. I do not remember what my testimony on that point was at that time.

Q. Can you now inform yourself as to the number of free telephones? A. I think it is possible to do so.

464 Mr. BIRNEY: Will you please do so?

Q. In the statement just put in evidence. I notice that the instruments in some Government departments are de-

scribed as switchboards. Please explain what that means? A. Some of the Government departments have branch exchanges and a switchboard instrument as named there is an instrument that must be used by the operator at each one of these small exchange switchboards to place one subscriber in connection with another.

Q. That exchange, then, includes the particular building in which that switchboard is located? A. It may include that building only, or it may be some telephone outside of that building connecting detached offices.

Q. To which account in your books is the inside work done in installing telephones charged? A. Subscribers' telephones?

Q. Subscribers' telephones. A. That is charged to maintenance.

Q. Do you pay rentals or royalties for any other instruments than the receiver and transmitter? A. We pay a royalty on the switchboard.

Q. Of what amount and to whom? A. We pay to the owners or those who control the patents for the switchboard a royalty of $1 a year for each drop actually in use, that charge being confined wholly to the multiple boards, and not
465 applying to branch exchange boards.

Q. Then your company does not own the multiple switchboards? A. We purchased the switchboard with the understanding that its use involves the payment of royalty.

Q. Then how much do you pay per year? A. That I do not know.

Q. How do you determine the number in use? A. We determine the number in use by our knowledge of the necessary number of working wires between a switchboard and subscribers.

Q. At what time do you make that determination? A. We take the number of subscribers for each month of the year and average the number.

Q. Who are the owners to whom you make this payment of royalty? A. I do not know who owns the patents, but we make that payment to the Western Electric Company.

Q. Is there any other article upon which you pay royalties? A. Not to my knowledge.

Q. And no other article which you rent? A. No, sir.

Redirect examination.

By Mr. WORTHINGTON:

Q. Mr. Bryan, why is it that the inside work of putting
466 in telephones in subscribers' places of business is charged to maintenance? A. The entire charge is not made to maintenance. That part of the work of installation which represents the wire, attached to the inside of the subscribers' prem-

ises, and which must necessarily from the time it is put there be useless for any other purpose, which cannot be taken away, and the labor (which of course is gone when the work is done)—those items are charged to maintenance, and there may be possibly the batteries charged there. But there is a certain portion of the cost of installation, represented by the magneto bell and the backboard, cabinet, or whatever furniture appertains to the station, that is not charged to maintenance, because we can take it back and use it elsewhere. Those articles that can be used again I am informed are charged to the account known as construction equipment.

Q. Is there any explanation which you can give us as to the increased amount which was spent for maintenance in 1897 over the years immediately preceding? A. The explanation of that is that, with the change in Commissioners of the District of Columbia, by which Major Powell was brought here as Engineer Commissioner, the policy of the Commissioners' office in construing liberally the laws relating to the company, and what it might do in the way of repairs, construction, &c., was changed so as to very materially restrict the company in the work of keeping the plant in good condition. These re-
467 strictions became, prior to March, 1897, so severe that we were not able to furnish telephones to subscribers desiring to have them, more than 100 subscribers having their contracts on file, and being unable to obtain service. On the 3d of March, 1897, there was passed the appropriation bill for the District of Columbia, which contained a paragraph very much enlarging the privileges of the company, in the matter of connecting up subscribers and allowing it to repair its lines and plant throughout the District. Directly following the passage of that law the work of repair and reconstruction was actively begun, and large repairs which should have been done in 1895 and 1896, but which had to be postponed until this enabling act was passed, were made.

Q. There have been put in evidence by counsel for the complainants certain statistics as to the rates paid by subscribers to the exchanges in Martinsburg, Cumberland, Hagerstown and Westminster, from which it appears that the rates charged there for the same kind of service are considerably less than the rates paid in Washington. What explanation is there of that? A. The explanation is that all the service rendered in those towns is by means of overhead lines, and on a much lower priced scale of construction than we are compelled to employ in a large city. The switchboards in use there are not multiple; they are inexpensive to build and inexpensive to operate. In addition to that the requirements in small places are nothing like so great as they are in the larger cities; we
468 are able also to obtain our help in the country towns at a very low rate, it frequently happening that for a local

manager or for clerical help we are able to obtain suitable men for possibly $10 a week, in the neighborhood of $40 a month, while in the cities the expense is very much heavier. Another thing is that a manager of one of the small exchanges will not only act as manager collector and disbursing officer, but will take upon himself the work of connecting up the instruments, inspecting them and sometimes even go so far as to do the work of a lineman in climbing poles. By all these means we are able to supply those towns at very much less rates than a city like Washington. In addition, we have for small towns a special system known as common battery, at least for some of them; and at other places we have special systems where there is no common battery, by which Hagerstown, for example, has from one to six people on a line; the apparatus adapted to the use of six people on one line of course very much reduces the cost of construction and maintenance. In Cumberland our special system is adapted for four subscribers to a line, although some lines are special. The wire used in all these places is iron, instead of copper.

Q. Are you able to tell us anything as to whether the business of the company in these smaller towns is carried on at a profit or at a loss? A. The last time I had occasion to investigate that matter I found that for several years the busi-
469 ness in some of the towns had been carried on at a loss, while others showed in some years a loss, and at no time any material profit.

Recross-examination.

By Mr. BIRNEY:

Q. Mr. Bryan, did you not in your annual report, made to the directors of your company under date of February 23, 1898, state that the amount added to construction equipment and construction during the year 1897 was $39,654.28? A. It seems so, from this book of testimony taken before the House committee. That was for the entire company.

Q. Did you not also report at that time (page 367) that in Washington and its territory there were erected 691 new poles in the county and 94 new poles in the city limits? A. That appears here.

Q. And that the increase in poles during that year was 783? A. Yes.

Q. Did you not also report that the increase in miles of line wire in the territory of Washington was 621, there being 796½ miles of line wire put up and 175½ taken down? A. Yes.

Q. Did you not also report that you had drawn in
470 cable to the extent of 29,663 feet, and had drawn out only 897 feet in that year? A. Yes.

Q. And that the total of grounded wire cable abandoned was 12,253 feet? A. Yes.

Q. That abandoned cable being in the solid system? A. Yes.

Q. Did you not also report that the main subways constructed during that year in this territory contained 48,694 feet in all, and that the abandoned main subways contain 306 feet 6 inches? A. Yes.

Q. And did you not also report that the total extent of branches in streets constructed in that year contained 1,866 feet 1 inch, while the abandoned branches in streets contained 46 feet 11 inches? A. Yes.

Q. And that the branches constructed in alleys in that year contained 1,149 feet 3 inches, while those abandoned in alleys contained 27 feet? A. Yes.

Q. And that the abandoned asphalt conduit contained 12,590 feet of asphalt duct, and that this was abandoned on account of the cables occupying these ducts being abandoned? A. I did.

471 Second redirect examination.

By Mr. WORTHINGTON:

Q. Mr. Bryan, was not the whole of what you stated in the report of January 31, 1898, which has been referred to on the subject of Washington and its territory, as follows:

472 THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY,

Washington, D. C., *January* 31, 1898.

The Chesapeake and Potomac Telephone Company (Mr. Samuel M. Bryan, President and General Manager), Washington, D. C.:

Dear Sir:—I beg to submit this report, showing the amount of construction for the entire territory, and also a statement of the work done during the year ended December 31, 1898:

In Washington and its territory there are as follows:

89,160 feet of 100-pair, No. 19 gauge, Patterson underground cable.
39,566 feet of 50-pair, No. 19 gauge, Patterson underground cable.
15,252 feet of 50-pair, No. 18 gauge, Patterson underground cable.
936 feet of 25-pair, No. 19 gauge, Patterson underground cable.
100 feet of 10-pair, No. 19 gauge, Patterson underground cable.

145,014 total feet of underground cable.
23,362,600 total feet of conductor in underground cable.

4,424.7 total miles of conductor in underground cable.
27.5 total miles of cable.
6,807 feet of 25-pair, No. 19 gauge, Patterson aerial cable.
340,350 feet of No. 19 gauge Patterson aerial conductor.

64.5 miles of conductor in aerial cables.
1.3 miles of aerial cable.
473 151,821 total number of feet of cable of all kinds.
28.76 miles of cable of all kinds.
23,702,950 total number of feet of conductor of all kinds.
4,489.2 total number of miles of conductor of all kinds.
The main subways contain the following ducts:
76 feet of 72-duct capacity, containing 5,472 feet of duct.
176 feet 3 inches of 64-duct capacity, containing 11,280 feet of duct.
748 feet 9 inches of 56-duct capacity, containing 41,930 feet of duct.
1,534 feet 5 inches of 40-duct capacity, containing 61,376 feet 8 inches of duct.
26 feet of 36-duct capacity, containing 936 feet of duct.
465 feet 6 inches of 32-duct capacity, containing 14,896 feet of duct.
304 feet 6 inches of 25-duct capacity, containing 7,612 feet 6 inches of duct.
2,072 feet 1 inch of 24-duct capacity, containing 49,730 feet of duct.
26 feet of 20-duct capacity, containing 520 feet of duct.
1,576 feet 3 inches of 18-duct capacity, containing 28,372 feet 6 inches of duct.
636 feet of 17-duct capacity, containing 10,812 feet of duct.
5,824 feet 9 inches of 16-duct capacity, containing 93,196 feet of duct.
212 feet of 13-duct capacity, containing 2,756 feet of duct.
4,963 feet 2 inches of 12-duct capacity, containing 59,558 feet of duct.
474 114 feet of 9-duct capacity, containing 1,026 feet of duct.
18,085 feet 1½ inches of 8-duct capacity, containing 144,681 feet of duct.
82 feet 6 inches of 7-duct capacity, containing 577 feet 6 inches of duct.
23,065 feet 3 inches of 6-duct capacity, containing 138,391 feet 6 inches of duct.
348 feet 11 inches of 4-duct capacity, containing 1,395 feet 8 inches of duct.
60,337 feet 5½ inches total length of trench, containing 674,519 feet 4 inches.

The branch subways contain—

2,758 feet 2 inches of 2-duct capacity in streets, containing 5,518 feet 4 inches of duct.

4,757 feet of 1-duct capacity in streets, containing 4,757 feet of duct.

1,175 feet 9 inches of 2-duct capacity in alleys, containing 2,351 feet 6 inches of duct.

10,723 feet 5 inches of 1-duct capacity in alleys, containing 10,723 feet 5 inches of duct.

19,415 feet 4 inches total length of branch trench, containing 23,350 feet 3 inches of duct.

Total for City.

Total of trench subway, 79,752 feet 9½ inches, containing 697,869 feet 7 inches of duct, of which 234,174 feet is occupied by cables.

475 Total miles of trench subway, 15.1, containing 132.2 miles of duct.

There are 182 "P" manholes, 41 "A" manholes.

There are 1,400 poles in the city limits, 3,627 in the county, in this division; total, 5,027 in this division, or 143.6 miles of pole line; an increase of 783 poles up. Housetop fixtures up, 8; bridge fixtures up, 26.

There are at present 2,818.3 miles of line wire on poles, 45 miles of line wire on house tops; total, 2,863.3 miles of aerial line wire up, making a total 7,352.5 miles of wire of all kinds; making an increase of 1,511.2 miles of wires of all kinds for the year.

509 miles of the aerial wire is No. 12 N. B. S. copper.

897 miles of the aerial wire is No. 12 B. & S. copper.

1,457.3 miles of the aerial wire is iron and steel.

2,863.3 total aerial line wire.

There is provision for 50-100 pair cables to enter exchange. There are 23-100 pair cables entering exchange at present, containing 4,600 wires, of which 2,600 are in use.

Work Done in 1897.

During the year there were 94 new poles set in the city limits, 691 new poles set in the county, 130 old poles replaced with new ones in the city, 221 old poles replaced with new ones in the county, 2 old poles abandoned in the city, being of no further use, 59 poles moved on account of improvements, etc., making an increase of 783 poles during the year.

476 Have put up 796.5 miles of line wire, of which 325.5 miles is No. 12 B. & S. copper, 246 miles is No. 12 N. B. S. copper, and 225 miles is iron and steel.

Have taken down 175.5 miles of line wire, of which 19.5 miles is No. 12 B. & S. copper, 12 miles is No. 12 N. B. S. copper, and 144 miles is iron and steel, making an increase of 621 miles of line wire for the year.

Have put up 26 bridge fixtures.

Have drawn in the following cable: 23,930 feet of 100-pair 19-gauge, 2,503 feet of 50-pair 19-gauge, 2,844 feet of 50-pair 18-gauge, 386 feet of 25-pair 19-gauge Patterson underground cable; total, 29,663 feet of underground cable drawn in, in 1897; 6,890 feet of 25-pair 19-gauge aerial cable put up in 1897.

Have drawn out 814 feet of 50-pair 18-gauge Patterson underground cable; 83 feet of 25-pair 19-gauge Patterson aerial cable; total, 897 feet of cable drawn out in 1897.

Have abandoned 5,728 feet of 100-wire 20-gauge, 6,525 feet of 50-wire 20-gauge Patterson underground cable; total, 12,253 feet of grounded wire cable abandoned, containing 899,050 feet of conductor.

This cable was in the solid system, and is abandoned on account of having been replaced by metallic cable in the new conduits.

Conduit Laid in 1897.

477 Main subways, 3,614 feet 11 inches, of 8-duct capacity, containing 28,919 feet 4 inches; 3,106 feet 10 inches, of 6-duct capacity, containing 18,641 feet; 283 feet 5 inches, of 4-duct capacity, containing 1,133 feet 8 inches. Total length of trench, 7,005 feet 2 inches, containing 48,694 feet.

Branches, streets, 863 feet 8 inches, of 2-duct capacity, containing 1,727 feet 4 inches; 138 feet 9 inches, of 1-duct capacity, containing 138 feet 9 inches. Total length of trench, 1,002 feet 5 inches, containing 1,866 feet 1 inch.

Branches, alleys, 175 feet 1 inch, of 2-duct capacity, containing 350 feet 2 inches; 799 feet 1 inch, of 1-duct capacity, containing 799 feet 1 inch. Total length of trench, 974 feet 2 inches, containing 1,149 feet 3 inches.

Total laid in 1897, 9,981 feet 9 inches of trench, containing 51,709 feet 4 inches; 30 new "B" manholes constructed.

Abandoned main subways, 51 feet 1 inch of 6-duct capacity, containing 306 feet 6 inches.

Abandoned branches (streets), 47 feet 5 inches of 2-duct capacity, containing 94 feet 10 inches; 46 feet 11 inches of 1-duct capacity, containing 46 feet 11 inches.

Abandoned branches (alleys), 27 feet of 1-duct, 27 feet of duct.

Have abandoned 9,045 feet of asphalt conduit,, containing 12,590 feet of asphalt duct, on account of the cables occupying these ducts being abandoned.

478 In Washington there are the following toll lines:

Location of Line.	Length.	Number of wires.	Miles of toll pole line.	Miles of toll wire.
Washington to Laurel, Md.	22	4 pairs	22	176
Washington to Waterloo, Va	5	3 pairs	5	30
Washington to Takoma Park, D. C	6	1 pair	...	12
Washington to Hyattsville, Md	7	1 wire	3	7
Washington to Rockville, Garrett Park and Kensington, Md	19	1 pair	19	38
Total			49	263

This toll line and toll wire is included in the statement of poles and wire hereinbefore mentioned.

Wires and subscribers connected with the Washington exchange December 31, 1897:

Grounded Circuits.	Wires.	Stations.
Special	1,174	1,182
Semispecial, 1 station	13	13
Semispecial, 2 stations	30	50
General, 1 station	5	5
General, 3 stations	5	15
General, 4 stations	2	8
General, 6 stations	1	6
Government department switchboards, trunks	8	19
Total	1,238	1,308

479 Metallic Circuits.	Wires.	Stations.
Lines of 1 station	443	443
Lines of 2 stations	43	86
Lines of 4 stations	3	12
Pay stations	113	132
Government department switchboards, trunks	16	163
Total	618	836
Total exchange subscribers	1,856	2,144
C. and P. trunks to Baltimore	4	
C. and P. trunks to Alexandria, Va	4	
A., T. and T. trunks to Baltimore	4	
A., T. and T. trunks to New York	1	
A., T. and T. trunks to Manchester, Va	1	
A., T. and T. terminal-loop subscribers	6	
Total	19	6
Total lines and stations connected with the exchange	1,875	2,150

Maryland Division.

480 A. Yes.

Q. I will ask you whether or not you, at the same time and as part of that report, submitted a statement of the treasurer of the company for the year ending December 31, 1897, which showed that the amount charged to construction in the year 1897 was $39,654.28? A. Yes, sir.

Q. In the report of February 23, 1898, with reference to which the fact has been brought out that you reported that the amount charged to construction equipment and construction during the year 1897 was $39,654.28, was not that statement qualified in the same sentence, thus: "As follows:

Construction equipment	$16,875.25
Aerial cables in Baltimore	3,303.81
Toll lines, Maryland division	19,475.22"

A. As an explanation of that those three items appear.

Q. In those three items which go to make up the $39,654.28 it appears right on the fact of the paper that two of the items belonged in Baltimore or some other place in Maryland? A. Yes, sir.

Q. As to the first item, construction equipment $16,875.25, to what part of that territory did that relate? A. Without in-

quiry I am not able to state, but it seems to me that it must have applied to the entire territory.

481 Second recross-examination.

By Mr. BIRNEY:

Q. Mr. Worthington has called your attention to the item "Aerial cables in Baltimore, $3,303.81;" is not that the entire amount which you reported for aerial construction in 1897 for the whole territory? A. I do not think so.

Q. Look at page 375 of the testimony taken before the House committee, to which we have been referring. A. That seems to be the amount.

Q. Now, will you state where and to what account you charged the 691 new poles erected in the county of Washington? A. About those new poles I would rather not answer, because the report quoted from was a report embodied in my report from the report of Mr. Crenshaw as general superintendent of construction. I know that a large number of those poles were put up in the county of Washington for the purpose of permitting through connection to the south for the Long Distance Company, and my understanding at the time that this statement was made was that these poles were reported as an increase of plant, because we had equal privileges there with the Long Distance Company. But the expense of putting up those poles was borne by the Long Distance Company. As to the details of that I prefer not to answer, because they are not so familiar to me as they are to the reconstruction department.

Q. To what Long Distance Company do you refer?

482 A. I refer to the American Telephone and Telegraph Company.

Q. If they were put up and paid for by that company, what place had they in your report as President of the Chesapeake & Potomac Telephone Company? A. There was a large amount of that work done by us and paid for by the Long Distance Company, which was practically an addition to our plant, because our privileges are equal to those of the other company.

Q. Does any such fact appear in this report? A. I do not know that it does.

Q. Do you not know that it does not? A. I take it for granted that it does not. That would be a matter that should not appear in this report.

Q. Where, if at all, in this report, did you charge the 621 miles of increase of line wire to construction? A. For that I should have to rely upon the construction department.

Q. Do you find in this report that it is at any point charged to construction? A. I do not find that it is charged to construction.

Q. Was any part of the cost of the underground conduits carried in that report to the account of construction? A. No, sir; for the very good reason that the underground construction account now stands charged with much more than the construction amounts to.

483 Q. Was any part of the increase in the draw-in cable over the solid system charged to construction? A. I do not know that I understand that question.

Q. We have already seen that there was an increase of cable reported here as found between the cable drawn in, less the cable drawn out, and the cable contained in the abandoned solid system. Did you charge any of that increase to construction, if so what part? A. I do not know what, if any, of that is charged to construction; and in looking over the report a few days ago I assumed that the cable that was drawn in to take the place of that in the solid system did not increase our facilities for dealing with our subscribers.

Q. It is a fact, however, is it not—and you can determine that by looking at page 375 of the volume before you—that no part of that increase of conduit and no part of the increase in cable was charged to construction. A. I see no charge appearing there.

Q. Were the 26 bridge fixtures reported as put up in that year charged to construction? If so, where? A. I do not know whether they were or not.

Q. Is not this the summary of what you then reported as having expended for construction in 1897:

"Expended for construction in 1897:

Exchange aerial	3,303.81
Underground conduits	
Underground cables	
Equipment	16,875.25
Toll lines	19,475.22
	39,654.28"

484 A. Yes, sir.

Q. Did not the item of cost of toll lines refer exclusively to lines erected in Maryland? A. Yes.

Q. The item of equipment found in that report referred to and expenses of that character—already explained, I think, by you—refers to your entire territory of the District of Columbia, Maryland and West Virginia? A. Yes.

Q. The paragraph quoted to you from page 375 of the book in your hand covers all the items charged to construction in your entire territory during that year, does it not? A. I assume that it does.

SAM'L M. BRYAN.

Adjourned to meet at 1 o'clock p. m. Saturday, December 3, 1898.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

485 WASHINGTON, D. C., December 3, 1898, 1 o'clock p. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney and Mr. Hemphill.

Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

ISAIAH H. FARNHAM, a witness of lawful age, called by and on behalf of the defendant, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. Please give your full name? A. Isaiah H. Farnham.

Q. Your age? A. My age is 46.

Q. Your residence? A. Wellesley, Massachusetts.

Q. What is your present occupation? A. I am the electrical engineer for the New England Telephone and Telegraph Company.

Q. What territory is covered by the operations of that company? A. The States of Maine, New Hampshire, Vermont and the most of Massachusetts, having about 200 exchanges and some 40,000 subscribers.

Q. How long have you held the position of electrical engineer of that company? A. I have held that position
486 since the first of 1885, from that time to the present.

Q. State generally your duties in that office? A. The making of plans and specifications for switchboards, subscribers' apparatus, directing the installation of all the apparatus; also making electrical tests of apparatus lines, cables, &c.; also, through a corps of helpers, making a general inspection of all apparatus, advising the company with reference to proposed apparatus and systems in connection with the telephone business.

Q. To what extent, Mr. Farnham, have the duties of your office called upon you to become informed as to the switchboard and other apparatus required to operate a telephone exchange, with differing numbers of subscribers? A. In order to make plans and specifications for new apparatus or changes in old it has been necessary to be well informed as to the uses of switchboard apparatus, the growth of the business, and all of

the facts which together forms the problem of telephone exchange work.

Q. If, in the company of which you are an officer, the growth of the business has rendered it necessary to re-equip the telephone exchange with apparatus capable of taking care of a larger number of subscribers whose duty is it to investigate and determine to what extent the apparatus shall be increased, and in what way? A. It is primarily my duty and the duty of my staff.

Q. Prior to 1885, when you took the position which you now hold, what was your vocation? A. For about five years
487 prior to that time (1885) I was superintendent and electrician for a division of the same company.

Q. What division? A. Covering the principal exchanges in the State of Maine.

Q. What principal cities in that State? A. Portland, Lewistown, are the larger exchanges; those are the principal ones, perhaps.

Q. To what extent did your duties in that position call upon you to be informed as to the equipment of a telephone exchange, and what was required in respect of equipment as the number of subscribers increased from time to time? A. The same knowledge and investigation were necessary with reference to the inside plant, and something more with reference to the pole lines and outside construction. I may say that at that time the company had no electrical engineer covering the whole territory, so that the duties of that portion of the territory devolved upon me at that time.

Q. In these several ways, to what extent have you been required to become familiar with what is known as the outside construction and work of a telephone exchange? A. My first duty in connection with the construction of lines was with the telegraph company, with whom I was employed prior to the invention of the telephone. As superintendent of a district of the telephone company it was necessary for me to be very familiar with the outside plant as well as the inside portion, in order to direct the work properly and to see that facilities were provided. Since that time my attention has been given
488 more closely to the inside plant. But in a general way it has also been given to the outside plant.

Q. Have you contributed anything to the literature of the subject of telephony? A. Yes, sir. I have written a number of papers, one of which was published by the Society of Arts in Boston, upon the subject of Protection from Strong Currents and Lightning, and one was written for the American Institute of Electrical Engineers, which meets in New York, upon the subject of Electric Corrosion of Buried Cables and Pipes. This

paper was published throughout this country in the technical journals, and also in France and Germany, and formed the basis of considerable work on that subject, which has taken place all over the country and world since the time the paper was presented in 1894.

Q. Have you had occasion to lecture upon cognate subjects at any time? A. I have given lectures on electrical subjects.

Q. I wish you would state in your own way, in the first place, what is the result of your experience and investigations as to whether the expense per telephone or per station in the telephone business increases or decreases as the number of unlimited service subscribers increases? A. The expense increases in a greater ratio than the number of subscribers increases.

Q. Will you state to what extent the increase per subscriber is in a greater ratio than the increase in the number of
489 subscribers, and also, so far as you can, what causes that progressive increase? A. There is a number of subscribers which can be operated per subscriber cheaper than a less number or a greater number. The figures may differ slightly in different territories, but somewhere from 300 to 500 subscribers may be the number of subscribers which may be operated at the least expense per subscriber. As the number increases beyond these figures the subscribers use their instruments a greater number of times per day, and consequently a less number of subscribers' lines can be cared for per operator as the size of the exchange or number of subscribers increases. It has been found in many exchanges that within fairly known figures, when the number of subscribers doubles, the use of the telephone per subscriber in a given time also doubles. This is no doubt due mainly to the fact that each subscriber in the larger exchange has more people with whom he can communicate than is the case in the small exchange. It follows, of course, that as an operator can care for only a limited number of subscribers, as the exchange increases, this number which the operator can care for diminishes, making it necessary to increase the force in the operating room more rapidly in proportion than the increase of subscribers. At the subscriber's station, the instrument being used more frequently in the large exchange than in the small, it requires more frequent inspection and repairs, and therefore the cost at that end increases more rapidly than the subscribers. The cost of equip-
490 ping a telephone central office shows a remarkable increase with the growth of the exchange. Suppose, for instance, we have an exchange of 1,000 subscribers, operated upon a multiple switch board, which is the accepted type for good service throughout the world, and we increase that number of subscribers to 2,000. On account of the peculiar con-

struction of this board (which brings within reach of every operator every subscriber's line in the office), when we double the number of lines, doubling the number of operators, we must extend the apparatus which originally cared for the 1,000 lines, to the new or added portion of board, in order that the added operators may also have direct communication with those lines. We must also place 1,000 new lines upon the new sections of board for the added operators, and extend these new lines upon the old board for the use of the original operators. It follows that the expensive portion of the switchboard must be increased four times when the number of subscribers is doubled, and this assumes no increase of use of telephone by each subscriber. If, however, the use of the telephone by each individual subscriber doubles, as is often found to be the case, then the switchboard must be again doubled in order to provide facilities for a sufficient number of operators. So that, under these conditions—and they are conditions which frequently prevail—the switchboard is increased eight times when the number of subscribers is doubled.

Q. You say that when you double the number of subscribers it frequently follows that the number of calls per subscriber in a given time is also doubled. Can you give us any idea
491 with what regularity that happens in exchanges, say of 2,000 or more subscribers? A. That is always true within reasonable limits. When I use the word "doubles" I do not mean that the figure exactly doubles; it may be a trifle more or a trifle less, depending on conditions in each city or exchange; but that is as nearly as can be briefly stated.

Q. What is the largest exchange in the territory to which your duties appertain? A. The largest exchange is the one located on Milk street, in Boston.

Q. Are you prepared to give us any figures in regard to that exchange which will show to what extent its experience corroborates the view which you have taken of this matter? A. I have some figures which substantially show this result: In 1885 there were in the principal Boston exchange 1,804 subscribers. According to the annual report of the company for that year the subscribers were making, on the average, 7.6 calls per day. In 1891 the same office in Boston accommodated 3,240 subscribers, and the number of calls per subscriber averaged, according to the annual report, 12. In 1888 there were 2,466 subscribers, and in 1889 there were 2,765 subscribers. The report shows that the average number of calls for both of these years was 10. In 1895 there were 3,319 subscribers, with an average number of calls of 15 per subscriber per day. In 1897 there were 4,064 subscribers, with an average number of calls of 17. During this last named year there were placed a few

limited service subscribers, which, if they were deducted, would leave the average number of calls 20.

492 Q. For the unlimited service subscribers? A. For the unlimited service subscribers. If, now, you compare the year 1885 with the year 1891, you will see the number of subscribers nearly doubled, and the number of calls per subscriber nearly doubled. Again, if you compare 1888 and 1889 with 1897, the number of calls per subscriber has again substantially doubled, with an increase in subscribers of not quite double.

Q. What has been the experience of this same Boston exchange during the same period with regard to the matter of the increase in the dimensions of the switchboard and its appurtenances as the number of subscribers increased? A. During the first year mentioned (1885) the operators cared for about 100 subscribers each. At the present time they care for about 50 each.

Q. With about how many subscribers? A. With about 4,000 subscribers. The switchboard at the present time for the accommodation of the subscribers has increased in length four times and in height twice. In addition to this, it has increased in both length and height, in order to accommodate trunk line apparatus necessary to reach other exchanges in the city. The switchboard, therefore, during the time that the number of subscribers has doubled, has increased more than 8 times.

Q. I will ask you whether this increase in the number of operators and in the switchboard and its appurtenances
493 has equaled or been more than the growth of the business required? A. On the contrary, we endeavor to run the business as economically as possible, and employ no more operators at the switchboard than are absolutely necessary.

Q. You have given us some figures in reference to the largest exchange in your territory. I would like to ask you to what extent, if at all, your experience with the other larger exchanges in your territory confirms the results which you have given us as to the principal Boston exchange? A. The results in the other large exchanges are substantially the same.

Q. Will you tell us whether or not your experience has shown that there is any limit to the number of subscribers who can be conveniently and satisfactorily accommodated with one exchange? A. Experience has shown that with the best switchboard used up to within a year, about 5,000 subscribers is the limit that can be properly handled in one office, or upon one board. With the latest type of board which is now being introduced it is hoped that this number can be somewhat exceeded, and possibly 8,000 may be handled on one switchboard. Experience, however, has not gone far enough yet to determine this positively.

Q. Can you tell us why it is that the number of subscribers whose business can be taken care of in any one exchange has a limit? A. As I stated in the early part of my testi-
494 mony, it has been found very desirable to so construct a switchboard that every line can be brought within reach of each operator, making it possible for one operator to complete every local connection which occurs in the exchange. For this reason as the number of lines increases the apparatus in front of each operator increases, until a time is reached when it becomes so extended as to be not easily reached or handled by the operators. At this point we are obliged to stop.

Q. Have you, at my request, prepared and brought here some charts helping to illustrate the results which you have been giving us verbally? A. I have.

Q. Please produce them.

Witness produces a chart which is offered in evidence by defendant's counsel, and the same is filed herewith, marked Defendant's Exhibit No. 19.

Q. Please explain this chart. A. This is a diagram designed to illustrate and make clear the fact which I have stated that when the number of lines in a telephone office is doubled the expensive part of the switchboard will be increased four times, and that if the number of calls per subscriber doubles the expensive portion of the board will be increased eight times. In this diagram the upper figure is supposed to represent a multiple switchboard which will care for 1,000 subscribers' lines. The circles marked A are designed to represent operators, although there is no purpose to fix the exact number; this would vary, depending upon the exchange. The
495 portion marked B represents the apparatus used by the operators. This increases in the same ratio that the number of operators increases. The portion of the figure marked C represents jacks and cabling necessary for the subscribers' lines in the office, involving the large expense in any switchboard. A reference now to the second figure on this sheet shows that this portion of the board is four times as great in order to accommodate twice the number of subscribers. The reasons for this I have already given. In a word, it is necessary, in order to carry the duplicate set of the old apparatus into the new portion and to carry the new lines and apparatus into both portions of the board.

The lower figure on this chart illustrates the effect of increasing the number of calls per subscriber to double the original number when the number of subscribers themselves doubles. In this case the switchboard must be extended twice the length in order to accommodate the proper number of operators, which increases the jack portion of the board or the expensive portion eight times.

Q. What is a jack, Mr. Farnham? A. It is a piece of apparatus which brings the subscriber's line within a position where the operator can make connection to it from another line.

Witness produces a second chart, which counsel for the defendant offer in evidence, and it is filed herewith, marked Defendant's Exhibit No. 20.

Q. Please explain this chart, Mr. Farnham. A. This
496 chart has been made to show the effect of dividing a city or exchange into two equal portions, and placing a switchboard in each of these portions, connecting them together by trunk lines. It will be observed that, in addition to the usual number of operators and operators' apparatus and jacks, as we call them, for handling the service in that particular part of the city, there must be added apparatus in front of each operator by which she can connect with the other exchange in the same city, and, in addition to this, a very large increased cost in apparatus and operators as well, for receiving calls from the neighboring exchange. I think the lettering, as it follows the other chart, explains substantially the facts.

Q. What is indicated on this chart Exhibit No. 20 by the portion opposite the letter F, which is not in Exhibit No. 19. A. That represents the portion of switchboard which must be added in order to accommodate the incoming trunk line business from the other exchange, and forms a substantial portion of the exchange outfit.

Q. What is indicated on this chart Exhibit No. 20 by the part of the apparatus which is opposite the letter D? A. This is apparatus placed upon the entire length of the switchboard by which each operator may connect with trunk lines extending to the second office. We would call it outward trunking apparatus. The heavy lines in this chart indicate that a certain number of lines extend from the trunking apparatus to the inward trunking portion of the second switchboard, and
497 a like number of lines from the outward trunking portion of the second office to the inward trunking portion of the first office.

Q. I wish you would state in this connection, referring to the parts of this chart Exhibit No. 20, as you go along, what happens when an operator in one exchange is requested by a subscriber to put him in communication with a subscriber who belongs to the other exchange. A. The methods of "trunking" may slightly differ in different exchanges, but the most approved method is this: We will suppose that subscriber No. 10 in office No. 1 wishes to communicate with subscriber No. 1,000 in office No. 2; the operator in office No. 1 receives the signal from subscriber No. 10, learns with whom he wishes permission

to communicate; she then presses a button, which puts her in communication with one of the operators in front of the portion marked F of the second switchboard, or of switchboard in exchange No. 2, and says to this operator, "Give me No. 1,000;" the operator in office No. 2 designates by telephone to the operator who has just called for subscriber No. 10 which trunk line to use in office No. 1 in establishing this connection; the operator in office No. 1, by means of her cords and plugs, then connects the line of subscriber No. 10 with the trunk line which has been designated; the operator in office No. 2, by means of a cord and plug, then connects the trunk line which she has named to the subscriber's line No. 1,000, and by pressing a button rings the subscriber's bell. This completes the connection, and the subscribers are ready to talk.

498 What determines, in the first place, the proportion which that part of the switchboard represented by the figure F shall bear to the remainder of the switchboard, and, in the second place, the number of trunk lines required? A. A study of the particular exchange has to be made in order to determine this with any accuracy. If the exchange is in an ordinary or medium sized city, and if you assume to divide that city through the center, so that one exchange in it is as important as the other, the number of calls trunked from one office to the other will be nearly as great as the number of calls completed in either of the given offices.

Witness produces a third chart, which counsel for defendant offer in evidence, and the same is herewith filed, marked Defendant's Exhibit No. 21.

Q. What does this chart illustrate? A. This is carrying the principle of dividing the exchanges to a greater extent. It represents four exchanges or four central offices in one city, the territory in each supposed to be equal in importance to the territory in each of the others. In this case more than half of all the calls made in either office must be trunked to some other office, and the trunking portion of the switchboard with its operators and trunk lines becomes the principal portion of each office.

It may be stated here that in order to give the best service under these conditions, it is necessary to extend direct trunk lines from each office to every other office. Therefore, when we have four offices in a given city, we should have six dis-

499 tinct routes of trunk lines. The number of these routes of trunk lines increases in a greater ratio than the number of offices in a city.

Witness produces a fourth chart, which is offered in evidence by defendant's counsel, and the same is filed herewith, marked Defendant's Exhibit No. 22.

Q. What does that chart represent? A. This is carrying the dividing of exchanges further, to the number of 6 distinct exchanges in one city.

Q. And requiring how many independent trunk lines? A. In this case there will be required 15 independent sets of trunk lines, in order to connect each one of the six offices directly with each of the other five offices.

Q. As the number of exchanges increases what becomes the most expensive part of the system? A. The trunking portion.

Q. What effect, if any, upon the character of the service furnished to subscribers, follows from multiplying exchanges? A. The service necessarily is impaired by multiplying the number of exchanges. In a city with a single exchange a subscriber communicates with a single operator, and she makes the connection directly to the line wanted. If there are two or more exchanges in one city, the call has to be repeated through at least two operators. This doubles the opportunity for errors or misunderstandings, and slightly increases the time necessary to complete the connection. If, instead of running di-
500 rect trunk lines between all of the offices (if there are several), it is considered best to centralize the trunk lines, it follows that, for many connections three operators must be employed in the work, thus increasing the chance for errors three times as against a single office system.

Q. Aside from what your own experience and observation have taught you as to the effect upon a telephone exchange of an increase in the number of subscribers, have you made any special study of that subject with a view to ascertain what is the result of investigations made by others, and informed yourself generally as to the history of the business? A. I have made a study of this problem in many exchanges. I have learned from Mr. Preece, who is at the head of the Government Telegraph and Telephone system in England, his views in regard to this matter.

Q. Do you refer to William Henry Preece? A. I do.

Q. Can you tell us what the position is which he holds in England? A. He is engineer in chief of the British Post Office.

Q. I believe that in England the post office authorities carry on the telephone business as part of the Post Office Department? A. Part of the telephone business is carried on by the Government.

Q. What has Mr. Preece to do with that telephone department of the Post Office Department? A. He is at the head of it.

501 Q. Do you know whether or not Mr. Preece has made any special study of this subject, aside from the experi-

ence which he gets from the managing of his own affairs? A. He has not only made a study of the business at home, but generally.

Q. Can you tell us what his reputation is among men interested in business of this kind, as an expert in such matters? A. He has the highest reputation.

Q. Have you brought here an official publication of the House of Commons of England, which contains Mr. Preece's testimony upon this and other subjects? A. I have.

Witness produces a document entitled:

"REPORT

TELEPHONE SERVICE.

Ordered, by the House of Commons, to be printed 1 July, 1895.

London:

Printed for Her Majesty's Stationery Office, by Eyre and Spottiswoode, Printers to the Queen's Most Excellent Majesty."

Q. Please read from that any portions of statements made before that committee by Mr. Preece which refer to this
502 subject.

To this counsel for complainants object on the ground that the same is incompetent.

A. On page 22 I find the following:

"Chairman.

369. With reference to that last question, is not the reasonableness of the charge rather dependent upon the service which is given?—Yes.

370. And is not the case, therefore, that in a large area a large number of subscribers to a telephonic exchange with a large number of people not only causes greater expense, but justifies an increased charge?—Yes, I think it does it, in two ways; the larger area not only requires a greater expenditure on plant, because the plant extends more widely, but it also brings into communication with each other a very much larger number of people, and the increase of cost in putting a large number of people in communication is not proportionate at all; that is to say, if you had a thousand subscribers who required to be put through to each other, each of these thousand persons could only possibly communicate with 999, whereas, if you put into communication on an exchange system 10,000 people, each of those subscribers could possibly speak to 9,999; and therefore the more you increase your exchange the more you in-

crease (and immensely so) the number of communications that each subscriber can make, or wishes to make, and you increase enormously your cost at your central office (or your central offices if you have more than one) of putting these people into communication with each other.

503 Mr. Snape.

371. But taking that illustration, in the first case you only have a thousand persons contributing to the revenue of the Telephone Company; in the second case you have 10,000 persons; so that, if there is increased expense, you have another 9,000 subscriptions towards it?—That is so. And of course the increase with regard to maintenance of wires and apparatus may be proportionate; but what I was speaking of was the cost of working the exchange in putting the subscribers into communication with each other. Now the increase there is much more than proportionate to the increase in the number of subscribers. If you have a thousand people on these wires, of course you have the expense of a thousand wires; and if you have ten thousand it may increase the expense of the wires only ten times. No doubt it is proportionate there largely, but when you are dealing with the work that is done on the system, you are dealing with the possibility of putting each one of those persons in turn into communication with 9,999 people; that is to say, in a given day one of these subscribers on the larger system could ask the company to put him into communication in succession with 9,999 people, whereas on the smaller system he could only possibly ask them to put him into communication with 999.

372. That is so; but the possibility of his doing it is not probable, and I presume the provision of working arrangements would be according to the law of averages and not according to possibilities?—I have put it in the extreme case, because the extreme is the only figure known to me; but the average

504 follows exactly the same law."

Also the following from page 152:

"Sir Julian Goldsmid.

2698. In any case the cost to the company will be more the more subscribers there are, as you say?—Certainly.

Chairman.

2699. Because the larger number of subscribers means a larger number of conversations per subscriber, and therefore a smaller number of subscribers to each operator?—That is so.

2700. And no doubt the cost of the operators, the staff, is a

very important element in the cost of the service?—It is almost the standard from which all calculations of working expenses should be made.

2701. Would not the same argument apply to the increased cost of the mechanical work, which would increase in consequence of the larger number of subscribers?—The cost of the mechanical work (that is, engineering and maintenance) will increase, pro rata, with the number of subscribers and the number of circuits; but this increased cost would not follow exactly the same rate of growth as the other one.

2702. Do you mean it would be a pro rata increase?—It would be a pro rata increase. Whatever is the annual maintenance charge for one subscriber will be doubled for the second subscriber at the same spot.

2703. You are referring to wires, perhaps?—I am referring to circuits outside the exchange.

2704. When you come to mechanical work inside the exchange, the switch boards, what do you say?—With the
505 multiple board the cost inside of fitting up the exchange with a multiple switch and all its accessories increases as the square of the number of subscribers; for instance, supposing you had a multiple board for 2,000 subscribers, and you doubled the number to 4,000 subscribers, the cost of the switch and its accessories would not be twice as much; it would be four times as much; and when you come to 10,000 switches (the number I spoke of at first) it is this growth which renders these large multiple switches prohibitive.

2705. That is so, not only with regard to the cost of staff, but the mechanical work inside the exchange; the cost to the company increases far more rapidly than the increase in proportion to the number of subscribers?—Certainly.

* * * * * *

2706. Is that why they have given up the multiple board in Chicago?—I think that must be one cause. It is not mentioned in their correspondence, but I think that must be one cause why they are seeking for other means so to dispense with the multiple board.

Chairman.

2707. Does that fact make a comparison between London and the charge for the service in London, and the service in a place like Stockholm or Christiana somewhat inappropriate?—I think it has to be taken into serious consideration in drawing comparisons.

2708. Have you anything further to say upon that?—Yes; I should like to mention this point (I think it is a very im-
506 portant one, and one which the committee should bear

carefully in mind), that whatever may be the annual rental, the working expenses must increase with the number of subscribers, and therefore the balance between revenue and working cost must diminish; so that if the rental is too low and the subscribers too many, the working expenses will exceed the rental, and rates will have to be increased; in fact, sir, that is a point that has already been raised on the continent, in Germany and in Switzerland."

Q. Do you know of a French expert in this line whose name is E. Hospitalier? A. I know of him and his work.

Q. What is his reputation as an expert in these matters? A. He is considered an expert.

Q. Have you at your command anything which he has written upon this subject? A. I have an article which appeared in the Scientific American.

Witness produces a copy of the periodical called The Scientific American, dated January 26, 1895, upon pages 53 and 54 of which appears an article to which is appended the signature E. Hospitalier, in La Nature, the article being headed, "The New Telephone System of Paris."

Q. Please read in evidence so much of that article as relates to the particular subject which we are now investigating.

Objected to by counsel for complainants on the same
507 ground as stated to the previous objection.

The witness reads as follows:

"At the acquisition of the lines by the State the tax was reduced from $120 to $80, and this reduction led to so rapid an increase of the number of subscribers that it became necessary to entirely modify the processes and the communicating apparatus in order to respond to the requirements, which, it must be admitted, exceeded the resources of the art and which had not as yet manifested themselves so rapidly in any other city in the world, even in America, where, nevertheless, telephony had birth, but where higher tariffs, with good reason, curtailed the number of subscribers. We say with good reason, contrary to the general public opinion, for if, in larger cities, the prices were low enough to permit from 150,000 to 200,000 persons to become subscribers to the telephone, the latter would no longer render any service, in consequence of the excess of the number and the slowness of the communications. The expenses of establishment, of maintenance, and of personnel would even no longer be covered by the receipts, since all the expenses sensibly increase as the square of the number of the subscribers, while the receipts, based upon a fixed tax, increase only proportionally. Sooner or later, and by the very force of circumstances, the price of $80 will become inadequate, and it will be necessary either to increase it or to make the budget

support the deficit. The subscribers to the telephone will thus become new privilegees of the State."

508 Q. Can you add anything to what you have already said, Mr. Farnham, as to your experience which enables you to testify as to the probable lifetime of the different parts of the telephone system or indicate what is a proper allowance for depreciation of plant? A. I am entirely familiar with what has taken place during the last twenty years in the conditions of apparatus and plant.

Q. I now wish you would state what your experience has taught you on that subject? A. Of course any figures given on this line are only averages, and cannot be taken to apply to any one specific case or place. My experience will show that from 8 to 15 years would be the life of ordinary poles, depending upon the kind of wood, the nature of the soil, the local climate, &c. Poles are not only depreciated by natural decay, which occurs principally near the surface of the ground, but by fires, sleet storms, heavy winds, changes in location, lightning, &c.

Iron wire, used in most cities for telephone purposes, No. 12 galvanized, will last from five to eight years; in the country its life is longer; in a city the gases from coal destroy the galvanizing, and rust acts rapidly upon it; and in addition to the natural decay of wire the lines are broken by storms, fallen trees, &c., and depreciate from this cause.

Hard drawn copper wire, which is used to some extent in exchanges, and particularly for connecting distant exchanges together, experiences much less depreciation from corrosion, but deteriorates rapidly from mechanical injuries. The

509 strength of copper wire seems to lie mainly in the outside, and when this is scratched or marred the wire will break easily. This wire will allow a stretch or elongation of about 1 per cent, from 1 to 2 per cent, before breaking. In sleet storms or very high winds the strain upon the wire being not enough to break it, often times produces the elongation, and as these wires must be again drawn up taut, to prevent crosses, the second strain, either from sleet or wind, will be almost certain to break the wires, since no further elongation can take place, and since a much less strain upon a taut wire than upon a slack wire will break it. The usual changes in lines also cause them to depreciate. Hard drawn copper wire is comparatively a new article in use, and it would be something of a guess to undertake to say just its life, but this is true: that it has been found, after storms have broken the wires to a considerable extent, and especially taken out the stretching quality, that they are practically of little value, and are usually consigned to the junk heap and replaced by new wire.

Underground conduits, we suppose, will have a comparative-

ly long life. They are subjected, however, to deterioration from workmen in the streets digging about them, striking them with their picks, and also to the decay of the burlap which is used in making the joints, and to freezing of the soil which sometimes throws the conduit and cracks it, &c.

Aerial cables are subjected to falling wires and to strong currents, which will melt the sheath; to lightning, falling trees, sleet, and to changes made necessary by the development
510 of telephone business and systems. Another fact which has proved important in connection with the aerial cables is that, as they are not a permanent part of the construction, they are frequently removed from one place to another, and the handling of these cables greatly depreciates them. I mean by handling, taking down from the poles, rolling on reels, and putting up again at another point.

Underground cables are subjected to many of the dangers appertaining to overhead cables, and also to corrosion due to gases and certain impure water found in the streets and to electrolysis and to small injuries in local points. Allowing water to enter permanently damages a comparatively long piece of cable; for instance, suppose a pick is driven into the cable; to repair the cable a section between two manholes or streets crossings must be withdrawn, and this section, two or three hundred feet in length, is of practically no further value.

There is constant development in telephone cables, as well as in other parts of the apparatus, which also gives them a comparatively short life. Experiments are going on now which may lead to the changes in many of the cables to meet the advancement in the art.

The central office switchboard heretofore has been a thing of only a few years' life; it has not averaged in large exchanges more than six or seven years. We hope the life of new switchboards and their appurtenances, as they are now installed, that their life may be increased beyond this. The movable parts of a telephone switchboard which are handled by the operators are given on the average about 45,000 movements per year. The cords are replaced or repaired every few
511 months. Plugs, about once a year; the keyboard apparatus, which is a part of the operators' outfit, must be substantially renewed once in two or three years; the jacks, which are most frequently used, must be replaced in four or five years; lamp signals, which are now coming to be common, are replaced on the average of once a year; the cables which connect the parts of the switchboard together deteriorate in insulation, and there is no remedy, so far discovered, for this deterioration; when the insulation has sufficiently fallen the cables must be changed; the storage battery and dynamos,

which now form an important factor in central office equipments, will last not more than six or seven years without sufficient renewals to pay for new ones. I believe that the life of a switchboard, as a whole, cannot be fixed at more than ten years, and this is better than has so far been accomplished. Subscribers' station apparatus, we figure, may last about ten years. So far it has not reached nearly that length of life. Whenever a subscriber ceases his connection with the exchange or moves from one place to another, his instrument must be practically rebuilt, must have a new case, the metal parts of it having to be renickeled, and the instrument made substantially new. Damages occur to this part of the apparatus by lightning or strong currents, and by fires which occur in subscribers' premises. The progress and development of the business also affects these instruments. In the territory of the New England Telephone and Telegraph Company we are now, and have been for some time, making over 600 bells per
512 month. Two renewals equal in cost the cost of a new bell. With the number of subscribers in that territory these figures mean a rebuilding of the bell once in from five to six years.

Q. Taking the switchboard and its appurtenances, as a whole, can you give us any information as to what the approximate cost of that apparatus is in larger exchanges? A. It would have to be figured definitely. It is a little hard to make a general statement which would apply very well. The present Boston board, which accommodates 4,000 subscribers, and the necessary trunk lines, and was installed in 1891, has cost with its necessary additions upwards of $200,000. We are now making plans and specifications to replace that board by a new one.

Q. Who is making those plans and specifications? A. I am, with my force.

Mr. WORTHINGTON: Mr. Birney, I want to ask the privilege here of recalling Mr. Nevius, just to add one thing to his statistics. I want to examine Mr. Farnham about it, and it will be awkward to do it without getting the information in the case.

Mr. BIRNEY: Very well.

The examination of the witness was temporarily suspended.

BURNET L. NEVIUS, JR., was recalled for further ex-
513 amination for the defendant.

By Mr. WORTHINGTON:

Q. Mr. Nevius, have you, at my request, prepared a further statement in reference to the number of operators at the exchange here during the years 1885 to 1887, inclusive? A. Yes, sir.

Witness produces a statement, which counsel for defendant offers in evidence.

Said statement is filed herewith, marked Exhibit Defendant's No. 23.

By Mr. WORTHINGTON:

Q. What does this statement indicate, Mr. Nevius? A. The statement indicates the number of operators' positions on the switchboard through the various years, necessary to be filled during the business hours of the day.

Q. Who are the operators who are in this list, excluded, who are included in the list of the number of switchboard operators in Exhibit No. 11? A. I included in that first exhibit No. 11 the entire operating force, embracing the operators employed during the business hours of the day as well as those employed in the evening, and all on the night force; also those who were in any sense assistants, such as the assistant chief operator or the chief clerk or the supervising operator.

514 Cross-examination.

By Mr. BIRNEY:

Q. From what materials did you make up that list? A. From the records we have of the number of positions occupied on the switchboards at those times.

Q. In what way are those records kept? A. We have a record through the years of the number of subscribers' lines and subscribers in the switchboard, and the number of positions they occupied on the board.

Q. Is that a daily record? A. No, sir; it is not a daily record. It is a record made at different times during the years. We make it now regularly once a month, and have for a period of years.

Q. How often did you make it during the years indicated on that Exhibit 23? A. I think several times in each year.

Q. Can you give any more definite answer than that? A. That is all I am able to give at this time.

Q. Where is that record? A. In the exchange.

Q. Will you produce it for the inspection of counsel? A. It can be produced.

Mr. WORTHINGTON: Certainly; we will produce it.

Mr. BIRNEY: I would like to see it. This is not an original paper, of course.

Mr. WORTHINGTON: Now let me go on with Mr. Farnham. Mr. Nevius can be here at any time.

Mr. BIRNEY: Certainly.

515 Mr. WORTHINGTON: Let me first ask him this question.

By Mr. WORTHINGTON:

Q. I observe in this paper that there is a blank in the year 1884 as to the number of operators' positions. Why is that? A. I did not have the number at that time.

BURNET L. NEVIUS, JR.

Subscribed and sworn to before me this eleventh day of January, A. D. 1898. JOHN W. HULSE,
Examiner in Chancery.

516 ISAIAH H. FARNHAM resumed the stand for further direct examination.

By Mr. WORTHINGTON:

Q. Mr. Farnham, have you examined the exhibits on file in this case, numbered 7, 11 and 16, relating to the number of subscribers, the number of operators, &c., at various times, in the Washington exchange, for the purpose of ascertaining from them to what extent, if at all, they corroborate, or otherwise, the principles which you have been testifying to as governing the increase in cost in exchanges as the number of subscribers increased? A. I have.

Q. What conclusions have you reached, and why?

Mr. BIRNEY: That is objected to, as such a matter is not for expert testimony.

A. I find by looking at the papers that no record was given for 1884 of the number of calls the subscribers were making. It was impossible, therefore, to compare that year with other data. In 1885, with 1,096 subscribers, the calls were four and one-third each per day, and for the year 1897, with 1,822 subscribers, the calls were ten per day. Looking at the figures on this basis, while the subscribers during this period has not quite doubled, the number of calls per subscriber per day has somewhat more than doubled. Assuming the switchboard apparatus to be the same in each case, this would, of course, mean a proportionate increase of operators; that is, if the work of the exchange has increased four times or more, the number of operators must increase proportionately. I also learn

517 by inquiry that the number of operators stated in these lists included all operators, those on service at night, evenings, and those employed in supervising the office. In order to make a proper comparison of the operating force on the switchboard at any one time, of course these figures would

have to be corrected. It is clear, however, as I have stated, that the amount of work called for per subscriber has been increased more than double between the years 1885 and 1897, with a little less increase in subscribers than double.

Q. Suppose it appears, as a matter of fact, that the number of operators' positions named in the statement which you have just made have increased from 9 in 1885 to only 18 in 1897, only doubling, when it would appear that the amount of the work of the exchange has more than doubled. Is there anything within your experience that will account for that, to tell how it may have arisen? A. At so early a date as 1885 the apparatus was not in as good a condition, generally speaking, I mean now, throughout the country, as it is to-day; and for this reason the figures might be affected. Again, I think it is quite true that in the earlier days of the business a larger force of operators for the work to be performed was frequently employed than at present; not that the work could better be performed by a larger number, but the want of knowledge of the business and the best way of conducting it frequently led to relay forces of operators, with the belief that that was the best way to overcome certain difficulties. It must be evi-

518 dent that, other things being the same, the number of operators must increase in proportion to the amount of work which they are required to do, and the figures here indicate very plainly that when the subscribers doubled in number the connections required were four times as great or more.

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Farnham, will you give us again the name of the company by which you are employed? A. The New England Telephone and Telegraph Company.

Q. Are you a stockholder in that company? A. Not at the present time.

Q. When did you cease to be a stockholder? A. I don't remember. I have had a few shares off and on, and sold them as I thought there was a chance to make a dollar.

Q. Do you know the names of the members of the Board of Directors of the company? A. I cannot give them all to you now. They appear in our reports. Perhaps I can give you some of them.

Q. Give me those whose names you remember, please? A. Dr. Parker, of Lowell; I cannot give you his initials; Mr. Hyde, of Springfield; Thomas Sherwin, of Boston. I do not recall the names of the others.

519 Q. Is that company a licensee of the American Bell Telephone Company? A. It is.

Q. Do you know what proportion of its stock is owned by the American Bell Telephone Company, if any? A. I do not.

Q. How long has that company been engaged in the telephone business? A. I think that company, as organized under that name, since about 1883 or 1884. It was made up then of several smaller companies.

Q. Do you know the amount of its capital stock? A. I don't remember exactly. I have seen the figures, but I cannot state positively what they are.

Q. Are you a stockholder in the American Bell Telephone Company? A. I bought six shares a day or two ago. I have not seen the stock yet. That is all I own in it.

Q. Had you owned stock in that company before that time? A. Small amounts.

Q. Does the New England Telephone and Telegraph Company pay dividends on its stock?

Mr. WORTHINGTON: I object to that question as manifestly not proper cross-examination, and a question that ought not to be asked.

A. I understand that it does.

Q. Can you, before your examination is concluded,
520 give me the names of the other directors in that company whom you have not named? A. If I can find an annual report, or possibly by telephonic inquiry in Boston, I might do so. I have no means at hand to give you the names.

Mr. WORTHINGTON: Counsel for defendant state that they will get the information and give it to counsel without waiving their manifest objection to the immateriality of the question.

By Mr. BIRNEY:

Q. Has your practical experience in telephoning extended beyond the territory covered by the New England Telephone and Telegraph Company? A. In a general way I have studied the business in other parts of the country.

Q. Explain what you mean by "in a general way." A. I have visited other exchanges and studied the working apparatus and the systems in general.

Q. What study, if any, have you made in the other exchanges of the financial results of their operations? A. I have made no study of the financial results.

Q. What study have you made in other exchanges of the number of their subscribers, and the increase in the number of their subscribers from time to time? A. I have made inquiries in this direction, with many other inquiries, as I have visited these other exchanges. I have not the figures as definite

as with my own company, but I know in a general way that the same general principles obtain.

521 Q. What other exchanges in cities of considerable size have you visited in the course of your inquiries? A. Do you have reference to any special inquiry or to visits which I have made to learn more of the business conducted in a general way?

Q. In every way. A. I may say that I have visited no exchange with the express purpose of determining the exact data on the growth of subscribers or the growth of switchboards; but I have visited many exchanges for the purpose of learning the methods and apparatus employed by them, and incidentally, of course, the use of the instruments and the growth of the exchanges.

Q. What are the principal places which you have visited, and when did you so visit them? A. I cannot give the dates when I visited these exchanges without referring to the records at home; but I have visited San Francisco, I have visited Chicago, I have visited St. Louis, Buffalo, New York, Washington, Cincinnati and other places.

Q. Can you give us the size of the switchboard or the number of subscribers in the city of San Francisco? A. I cannot give you that with any accuracy at all.

Q. Can you approximate it from recollection? A. There are several central offices in San Francisco. I cannot give you a figure which will be of any value, much more than a guess now. It is two years or more since I visited that city.

Q. Can you state how the principal switchboard in that city compared with the principal switchboard in Boston in

522 size? A. The principal switchboard in that city was a peculiar switchboard, and my visit there was partly to compare its usefulness with that of other boards of the usual type. It cannot be compared in the way in which you mean with other boards. It was of the kind called the divided switchboard, in which all calls from one subscriber to another pass through more than one operator.

Q. Do you not recall about the size of that board, and the number of subscribers it accommodated? A. I think I stated there were several offices there. I can give you what my impression is, but I am not at all sure that it is within 25 or 50 per cent of being correct.

Q. Such as it is, we will take it. A. My impression is that in the largest office there were in the neighborhood of 2,000 subscribers; perhaps less rather than more.

Q. There were how many boards in the city? A. You mean how many offices?

Q. Yes; how many switchboards or exchanges? A. There is a good deal of difference, whether you mean offices or switch-

boards. In this particular office there were a great many switchboards. If you mean offices—

Q. How many exchanges then? A. I can't tell you exactly. My impression would be there were three or four.

Q. What is your recollection or your impression, if you cannot give us your recollection, as to the total number of
523 subscribers accommodated by that company? A. I cannot tell you the total number.

Q. Do you recall the charge made to subscribers in that city for telephone service? A. I don't think I ever inquired or knew the charge. That was not a part of my purpose in examining the apparatus. I certainly cannot tell it now. I think I never knew it.

Q. Did you inquire into the cost of service per subscriber in that city? A. I inquired into the cost as the number of operators and the number of subscribers affect the cost.

Q. Did you obtain the cost of service per subscriber; if so, what was it? A. I did not, as I have already stated, inquire any cost figures. My purpose was to compare service. If in one exchange an operator could care for twice as many subscribers as in another, it would follow that, other conditions being the same, the cost would be twice as great in one as in the other exchange.

Q. How did the number of operators in San Francisco compare with the number of operators in Boston? A. We found that it required a larger number of operators in San Francisco to give the same service than it required in Boston; this, notwithstanding more approved apparatus in the way of signals and automatic work in San Francisco.

Q. You have already stated that their system required the message to pass through the hands of more than one
524 operator? A. Always more than one; sometimes through more than two.

Q. Was there more than one telephone company operating in San Francisco? A. I cannot state positively about that.

Q. Did you make no inquiry? A. Of course that would not relate to the operating of the systems. I think there is a name there of a Sunset Telephone Company, and my impression is that there is another name; but how far they are separated or how far they are the same company I have no knowledge. I made no inquiry. I am not at all sure that there is any other than the Sunset Company.

Q. Would what you have told me as to San Francisco be the extent of your knowledge as to the systems in the other cities you have mentioned? A. I do not quite get that.

Q. Would what you have said equally apply to the other cities you have named as being visited by you? A. No, sir; not as a whole.

Q. Which one? A. Other cities have different forms of switchboards; and of course the results seen in San Francisco could not apply to those which operate in a different manner.

Q. In what other city did you make a more complete examination than in San Francisco? A. I know of no other in which I made any more complete examination.

Q. Did you obtain figures in any of them showing the
525 cost of service to each subscriber? A. No; no figures showing the cost of service in any of them.

Q. Have you ever obtained such figures from any other cities than those in your own territory? A. I have not, even in our own territory.

Q. What cities other than Boston are in your territory? A. There are two hundred other exchanges, about.

Q. What cities of considerable importance or size? A. Worcester comes next in importance.

Q. Worcester is a city of about how many people? A. About 100,000 is my memory now. I think it is about that.

Q. How many subscribers are there in Worcester? A. We have about 2,000.

Q. What are the other considerable cities, Mr. Farnham? A. Springfield, Massachusetts; Lowell, Massachusetts.

Q. Can you give us about the population of those places as you go along? A. I cannot give it near enough.

Q. Can you give us the number of subscribers in each place? A. I can give you approximately the number of subscribers. In Springfield, Massachusetts, there are about 1,400 subscribers; in Lowell, Massachusetts, about 1,400 subscribers; in Lynn, Massachusetts, about 900 subscribers; in Port-
526 land, Maine, about 1,200 subscribers; in Lewiston, Maine, about 600; in Bangor, Maine, about 500; in Holyoke, Massachusetts, about 600; in Cambridge, Massachusetts, about 600; in Haverhill, Mass., about 500; in Gloucester, Massachusetts, about 500; in Manchester, New Hampshire, about 500. There are a number of others that have about this number. Of course I am giving you these figures from mere memory, and they may not be very accurate.

Q. Are you familiar with the rates charged in these different places? A. Perhaps I ought to state, for fear there may be some later question come up, that there are several other exchanges in Boston city besides the one which I have referred to which have a thousand or more subscribers.

Q. How many of them are there, and what is the total number of subscribers in Boston? A. In the part of Boston which would be called the city proper there are about 8,000.

Q. Are you familiar with the rates charged to subscribers in these different places? A. I am familiar, as I have heard

them more or less. I have nothing to do with the rates, and I would not be sure that I repeated any of them correctly.

Q. Which of them can you give correctly? A. I don't know that I can give any correctly.

Q. Where do you reside? A. In Wellesley, a suburb of Boston.

Q. Do you know the rate charged in Worcester? A.
527 I cannot give it. There are a variety of rates. I would not be safe in undertaking to give the rates.

Q. How many times has the switchboard been changed, if at all, in Worcester? A. Four times, certainly, and I think five times.

By Mr. WORTHINGTON:

Q. In what period? A. Since the beginning of the business, about 1880.

By Mr. BIRNEY:

Q. When was the last change? A. About two years ago.

Q. Was there then an increase in the size of the board? A. Yes, sir.

Q. How great? A. Do you mean between the board put in and the board taken out?

Q. Yes; how great an increase? A. We always, in putting in a new board, make an increase for one or two operators, enough to last for perhaps a year or two years' growth. As I remember it, we made a similar increase there of perhaps 150 or 200 lines more than actually required for the subscribers to be served at that time.

Q. Was that change made by addition or by taking out the entire board and substituting another? A. Taking out the entire board and substituting a new one.

Q. That is not necessary, is it, Mr. Farnham, in the multiple board? A. Necessary for what purpose?

528 Q. Additions may be made to the multiple board, may they not, without taking out the part already in? A. Additions may be made to the limit of what an operator can take care of or to what an operator can reach.

Q. That is to say, new sections may be added? A. They can, up to a certain limit.

Q. What is that limit? A. As I stated in my direct testimony, about 5,000 subscribers.

Q. Please explain again what you mean by saying that that is the limit? A. The board is so constructed that a piece of apparatus representing each line in the central office must come within reach of each operator. Therefore, as you add lines, you must add apparatus in front of each operator, the old

operators as well as the new ones. When that apparatus becomes so massive that the operator cannot reach it to do her work upon it, that determines the size of the office.

Q. Then you think as a practical matter, the switchboard cannot be made so as to do efficient work which will have more than 5,000 drops? A. With the old type of board this is true. With the new type of board, which would be put in to-day, we should expect to get more than that number.

Q. When did that new type of board come upon the market?
A. It has been about two years or two years and a half since
the first one of what may be called the new type was
529 placed. There have been changes in the same board
ever since that date. In fact, there never was a day since the telephone business began that the changes have been more radical and extended than they are to-day in switchboards and the subscribers' apparatus.

Q. Who are the makers of switchboards? A. The Western Electric Company of Chicago and New York make the boards which we use.

Q. Who are other manufacturers of switchboards? A. I don't know.

Q. Have you not informed yourself upon that? A. I don't know, only in a general way.

Q. And you have made no investigations, I suppose, of other manufacturers? A. I have had no occasion to.

Q. As a matter of fact, you have not? A. I have not.

Q. In the territory covered by the New England Telephone and Telegraph Company are there any competing telephone companies, not licensees of the American Bell Telephone Company? A. There are or have been some small ones.

Q. Are there any in any of the cities you have named in your territory? A. There has been one in Manchester, New Hampshire, and one in Haverhill, Massachusetts. I think they are operating in a small way to-day, but I am not sure.

Q. You have no definite information upon that sub-
530 ject? A. Not recent.

Q. Are there any competing companies in any of the other cities named by you in your territory within your knowledge? A. I recall no other.

Q. What receivers and transmitters do you use in your territory? A. We use several types furnished by the American Bell Telephone Company.

Q. Where are they manufactured? A. I don't know.

Q. You say that there are in all about 8,000 subscribers in the city of Boston? A. In the city proper—that is, in the business portion—that is about the figure. I am only giving it to you from memory. There may be 9,000.

Q. How many persons are served by these connected exchanges, whether in the city or in its suburbs? A. You mean throughout the territory?

Q. Let me ask you this question first: Are the various exchanges you have mentioned as existing in the city of Boston connected by a trunking system? A. They are.

Q. How many subscribers are served by those various exchanges, so connected? A. All the exchanges throughout the entire territory are connected by trunk lines, and, there being about 40,000 subscribers, it is possible, through a trunk
531 line system and toll lines for any subscriber to reach any other one, and, in fact, to reach Washington or New York or Chicago. If I understand your question, that is the answer.

Q. Do you know how many subscribers other than those on toll lines, are connected to the Boston switchboards? A. The rates are such, or the arrangement is such, that subscribers in Boston proper, with the exception of the measured service subscribers, connect with all other subscribers in that district without a charge beyond the annual rental. I cannot say the exact number of stations which would come inside of this limit of free use of the lines, but approximately 12,000.

Q. Have you ascertained the average number of calls per subscriber among those 12,000? A. That would be divided up among different offices. I have given you the average number in the principal office in Boston. I could give you, at home, the average number in other exchanges. I have not the data with me.

Q. Can you give me the average number of calls per subscriber among the 8,000 or 9,000 who are connected through the city system in Boston? A. I cannot give you that from data which I have here.

Q. Have you not informed yourself upon that subject? A. I inform myself from time to time as the growth of the business and exchanges make it necessary to know; but there are too many such figures to undertake to carry them in my mind all the time. I have given you the figures on the principal Boston office, but I have made no figures on the others, be-
532 cause I was not aware that they would be wanted.

Q. In that principal Boston office there are how many subscribers? A. About 4,000.

Q. They are a part of the 8,000 or 9,000 of whom you have spoken? A. Yes, sir.

Q. That exchange deals principally with the business part of the city, does it not? A. There are two other exchanges that are in the business portion. The office which I have mentioned on Milk street covers the central portion of the business part of the city.

Q. Does it deal with subscribers outside of that business or central portion of the city? A. Certainly.

Q. To what extent? A. What do you mean?

Q. What proportion of the subscribers are outside of the business houses of the city? A. This exchange, as I have stated, is in the heart of the city. Therefore, all of the subscribers which connect with the exchange are in the heart of the city.

Q. Then it is in a place where you would expect to find the greatest use of the telephone, is it not? A. Not necessarily. I think our Oxford street office gives a record of calls per subscriber quite as great as the office located on Milk street.

533 Q. Is the Oxford street office also in the business portion of the city? A. It is.

Q. And it deals almost altogether, if not altogether, with business houses, does it not? A. Very largely.

Q. It is in the business portion of the city that you would expect to find the greater number of calls? A. Undoubtedly.

Q. And if that exchange covered the residence portion of the city as well as the business portion, you would expect to find the average number of calls per subscriber reduced, would you not? A. Undoubtedly.

Q. What is the difference, in your opinion, in the average number of calls in the business sections and the residence sections of a city? A. I can only give you approximate figures. I should say that in the residence section of Boston the calls were about one-half per subscriber per day of those found in the offices covering the business portion of the city. Of course it must be understood that even in the residence portion of the city there are, in addition to the residences, many business places.

Q. Have you ever ascertained the difference in the rate of calls between residences and business houses? A. I can't say that, making that division and taking territory as a whole, we have made any figures which would show the difference.

534 Q. Is there not a different rate charged to residences from that charged to business houses? A. Under the flat rate system there is.

Q. And with that difference in rate, has there been no investigation of the difference in extent of service furnished? A. I presume there may have been.

Q. Have you not informed yourself about it. A. I have not.

Q. Is the metallic circuit system in use in Boston as well as the grounded circuit system? A. It is nearly all metallic circuit system in Boston. There are some grounded lines.

Q. Do you know the flat rate charged for metallic circuit service? A. There are several different rates. I cannot tell either of them.

Q. In Boston to business houses? A. There are several different rates. I cannot name either of them.

Q. Can you give us any of the rates charged in Boston? A. I cannot give you positively the rates in Boston. I have had no occasion to memorize them.

Q. Have you informed yourself of the number of calls per subscriber at any given time in Boston? A. I have.

Q. At what periods have you so informed yourself. A. I have a memorandum here which gives something more
535 than I gave this morning. I have a memorandum of the average calls per subscriber per day, as given in our annual reports for a number of years. Some of those figures I gave you this morning. Others I have with me.

Q Have you also the number of subscribers at each of the dates mentioned in the statement you have made up? A. I have.

Q. How far back does the statement go? A. To 1885.

Q. What change has there been in the number of subscribers since 1885 to the present time in Boston? Does your statement refer to the principal exchange only or to the connected exchanges? A. It refers only to the principal exchange.

Q. Why did you take that exchange only when it forms only a part of one complete city system? A. Because it is the only exchange which could be taken for a period of years. Several of the exchanges are comparatively new. We might have taken other exchanges, even outside of Boston, but this was the largest exchange and covering the longest period of time of any, and therefore was taken.

Q. Did you include in that statement the number of subscribers at the other boards in the city? A. In this statement?

Q. Yes. A. No, sir.

536 Q. Then you have treated the 4,000 subscribers at the Milk street exchange as if they were all the subscribers connected, when in fact they were connected with 4,000 or 5,000 more? A. I stated in my testimony that there were other exchanges adjoining, which made it necessary to increase the switchboard, even beyond the growth which I had explained ordinarily takes place.

Q. How many exchanges in 1885 were there in Boston? A. If you refer to the part of the city which I have referred to in stating that there were now about 8,000 subscribers, there were two exchanges.

Q. And how many are there now? A. Covering the same geographical territory, there are five exchanges.

Q. In making up your statement, did you exclude calls made outside of that geographical area of which you speak? A. I did not include any calls made from other exchanges.

Q. Did you include or exclude calls made by persons through that exchange to persons outside the geographical area of which you have spoken? A. I included all calls made by all subscribers in the exchange of which I was speaking—the principal exchange. That is the manner in which we always make those records.

Q. What do your figures as made up in this way show, Mr. Farnham? A. I don't get the sense of your question.

537 Q. You say that a short time ago you had made up some figures showing the number of calls per subscriber at this Milk street exchange in different years. Will you state when these statements were taken?

Mr. WILSON: You mean at what dates?

By Mr. BIRNEY:

Q. At what dates you made up these statements or these statements were taken, and what figures you have reached. A. The figures which I gave embraced certain years between 1885 and 1897, and they tended to show—

Q. I ask you for the figures themselves. A. I thought you asked what they showed.

By Mr. WORTHINGTON:

Q. Mr. Birney understands you to say that you have made up the figures in other years besides those you have stated in your testimony. Is that so? A. Yes; but I am trying to answer the question. You wish the figures as I have them from 1885 to 1896?

By Mr. BIRNEY:

Q. Yes, sir. A. In 1885 the number of regular subscribers in the principal office was 1804. The number of calls per subscriber was 7.6.

Q. I think we have that. A. You have those figures, but I can give you the list complete. The question is whether you want this complete, or whether you want simply what I have not given before. In 1886, about 1903 subscribers. The number of calls per subscriber per day, I was not able to ascertain.

538 In 1887, 2,314 subscribers, number of calls per subscriber per day, 8.

In 1888, 2,476 subscribers, number of calls, 10.
In 1889, 2,765 subscribers, number of calls, 10.
In 1890, 2,969 subscribers, number of calls, 11.
In 1891, 3,242 subscribers, number of calls, 12.
In 1892, 3,616 subscribers, number of calls, 13.
In 1893, 3,704 subscribers, number of calls, 12.

In 1894, 3,946 subscribers, number of calls, 13.
In 1895, 3,319 subscribers, number of calls, 15.
In 1896, 3,661 subscribers, number of calls, 15.
In 1897, 4,064 subscribers, number of calls, 17, or deducting measured service calls, 20.

The reduction from 3,946 to 3,319, between 1894 and 1895, was caused by opening another office and taking a certain number of subscribers away from this one.

Q. Do you know when the other exchanges than that on Milk street were established? A. I cannot give you exact dates. One other exchange, as I have named, was in existence in 1885. Another was opened perhaps three years ago. I presume it was the one making this change of figures, which I referred to. Our Back Bay exchange, so-called, which really took no subscribers from the principal office, was opened about a year ago; and we have this summer opened still another, which has taken some lines from the principal exchange.

539 Q. Mr. Farnham, by what method did you reach these averages of calls per subscriber? When did you take your counts of calls, and what records, if any, did you preserve of them? A. We took a three days' record periodically. I am not sure whether it is taken once in two months, or once in three months. The results are preserved and tabulated. The count is taken by what is known as the peg count, the most accurate count which we have been able to get, and is superintended by the chief operator, and the figures are then compiled and preserved. This is true of all the larger offices.

Q. How long has that system been in use? A. For a long time. I can't say how long that particular method of counting has been in use, but we have made a practice, since the very first, of securing a count which would represent the business being done.

Q. How long has that been a systematic practice as to periods? A. I cannot say how many years, but for a long time.

Q. Can you tell how many times the count was made in 1897? A. No, sir; I cannot tell.

Q. Or in any of the other years? A. I cannot tell the exact number of times; no.

Q. Have you any figures to show the number of subscribers on the sub-switchboards or exchanges spoken of by you, in the city of Boston, and connected with the Milk street ex-

540 change, in any of the years from 1885 down to 1897? A. I have not the figures with me which would show that.

Q. You are not prepared then to give a statement of the number in any of those years? A. I am not, for I saw no occasion for bringing them.

Q. Mr. Farnham, what in your opinion is the cheapest sort of switchboard that can be operated. What sized switchboard will return a greater percentage of profit? Did I understand you to fix the line between 300 and 500 drops, or subscribers? A. Not to absolutely fix the line there. It is certain that in the different exchanges, that line will vary; but it is evident that there is a point in which the greatest economy or the greatest profit for a certain rate would be found. It is evident, certainly, that a single operator in a central office, having only a dozen subscribers, would be idle most of the time. Therefore, so far as operating is concerned, it would cost no more to raise the number of subscribers to fifty or 100, or perhaps more, than it would to operate the switchboard with a very small number of subscribers. Therefore, so far as that part of the service is concerned, it is evident that there is a point where the best results for the money could be obtained. On the subscribers' stations this would be true to a certain extent. There must be inspectors to keep the instruments in order. If there is such a number of stations that the inspector is not kept employed, then there would not be as great economy as in a case where one inspector or more was kept busy. The cost of rent
541 and fuel and lights for a very small office would be greater in proportion than for an office of moderate size. For these reasons it is evident that there is a point where an addition to the number of subscribers would be profitable at the same rate. What I mean by this is that the cost of operating per subscriber would be reduced; but beyond this figure, which I stated at perhaps between 300 and 500, then the figure runs the other way, for reasons which I have explained. I cannot say that 300 or 500 is the exact number, but from my general knowledge of the business I should say it would come in that vicinity.

Q. Have you ever determined, from experience or theory, the economical limit of the business in any place? A. I hardly think I can answer that question intelligently. My study with switchboards and apparatus and service is not sufficient to absolutely fix the figures, of course. I have already stated that when you exceed a certain number the cost of operating increases in a greater ratio than the number of subscribers increases.

Q. When you say the cost of operating, what significance do you give that word "operating?" A. I mean the cost of performing the service for the subscribers. Of course that includes, as a large factor, the operators and central office maintenance, and the care of the subscribers' instruments. If you refer to simply the lines of wire or the cables, it does not follow that the increase would be more than pro rata.

Q. Will it be so much as a pro rata in those parts of
542 the system? A. I see no reason, under ordinary conditions, why it should be different from a pro rata increase.

Q. Why should there be any increase whatever in the care of a conduit which contains 6 cables instead of one, separating now the conduit from the cables, in our consideration? A. Answering your question as you have put it, I do not see why there would be very much more cost in caring for a six duct conduit than for a one duct conduit. Of course the six-duct conduit costs very much more in the first place.

Q. I am not speaking now of construction, but of care for the conduit after construction. Is there any reason why there should be any increased cost in the care of that conduit that contains the six ducts over the one-duct conduit? A. You reject the factor that the conduit is built for a larger number of wires than you now name. If you build your conduit for one duct, and then when your subscribers increase you build it again for two ducts, and then again for three, of course your expense increases. If you build, in the first place, for six ducts, then you must look at it in the same light, that the cost of the conduit increases with the number of subscribers served pro rata.

Q. Suppose the conduit to be built in the first place of six ducts, two cables only being run in; would it cost any more to maintain that conduit after all the ducts are filled than
543 it did before, when only two of the ducts were filled, and if so, why? A. Of course a conduit, like everything else in the business, will go to pieces after a while. It follows that when a six-duct conduit goes to pieces, six times as much money, perhaps, has been lost, as when a one-duct conduit goes to pieces.

Q. My question refers to the care of the conduit. A. I cannot separate wholly the care from its depreciation. It is a fine point to separate those two things.

Q. You do not know then any reason why the care of the conduit with six cables in it should exceed the care of the same conduit with two cables in it? A. I did not say that. If you carry the same reasoning to the extreme, you might ask if a conduit of a thousand ducts would cost any more to maintain than a conduit of one duct. Of course it would.

Q. My question refers only to conduits of the same size. A. Conduits would not be of the same size, one having six and one one-duct.

Q. I have not referred to any such conduits. I have asked you, taking a single conduit of six-duct capacity, would it cost any more to maintain that conduit with six cables in it than with two cables in it? A. If I understand your question correctly, I do not see how it would cost materially more to

544 maintain a six-duct conduit partly filled or wholly filled with cables. It might cost more owing to the fact that the damage occurring to the conduit sometimes comes from the cables themselves.

Q. What kind of damage so results? A. Electrolysis sometimes damages the conduit as well as the cable. Drawing cables in and out—

Q. One moment. Does that come from the cable in the conduit itself?

Mr. WORTHINGTON. Finish your answer to the other question, Mr. Farnham, before you start on a new one. A. Sometimes drawing cables in and out of conduits damages them. Of course the more cables there are in a conduit the more workmen there are employed about the manholes and the conduit, and therefore the more danger of damage.

Q. Does electrolysis which may injure the conduit come from the cables themselves? A. Sometimes it comes from the cables. Sometimes it comes from an extraneous current—electricity.

Q. Which is more frequent? A. I cannot say.

Q. What proportion, if you know, does the completed conduit, without cables, bear to the cost of cables, given a conduit say of 6 ducts. A. I cannot answer that question. That is not directly inside of my work.

Q. Do you know the size and capacity of the ordinary cables now used? A. The cables we use in Boston vary from 10-pair to about 120-pair of wires.

Q. When you lay say a 120-pair cable, is it laid with reference to the number of subscribers then demanding its
545 use, or with reference to the number who may thereafter use it? A. The cable is usually laid with the intention of furnishing some spare conductors for immediate growth.

Q. From the time that that cable, with this surplus capacity, is laid, and until it is filled up, the cost per subscriber, so far as that part of the work is concerned, will decrease, will it not, with additions to the subscribers attached to it? A. I don't see how I could figure it in that way. It would be like saying that until another locomotive is necessary you would haul extra passengers free on a railroad train.

Q. Will there be any increased cost in the care of that cable after it is filled, that is after its entire capacity is taken up by subscribers, over its care prior to that time? A. There is liable to be; yes, sir.

Q. How? A. As I have stated, cables are damaged by strong currents, by lighting discharges on the conductors; and

the dangers of this kind would be greater with a greater number of wires in use in the cable. There may also be other reasons for the same results.

Q. Suppose a cable of that kind, say of 100 wires, with a surplus capacity of 50 wires above the present needs, would you say that the cost of the care of that cable would increase proportionately with the increase of subscribers at-
546 tached to it? A. You cannot base your figures on a single cable or a single instance. If you were to take this, which you have just named as an example, then you would have to take another condition to offset it, which would be like this: Suppose one cable is full; would there be any increased cost to add one more subscriber? It is evident that you have got to add then another cable with perhaps 120 wires, and the large increased cost then for adding a subscriber would go to balance the small increased cost in adding a subscriber in a cable which was not already full. You must take these figures and average them, it seems to me, to get any results.

Q. Do you distinguish between cost of construction and maintenance, Mr. Farnham? A. I don't know that I see how that question comes in there.

Q. I think it does, directly. You charge up, by your answer, the cost of the construction—that is to say, the laying of the new cable—as if it were a part of the expense of maintaining the cable. My question distinguishes between those two things. A. The care of the new cable would be the same, would it not? In one case you have the care of one cable, whatever that may be.

Mr. HEMPHILL: We do not ask the witness for an argument. We ask him for an answer to the question.

547 Mr. WORTHINGTON: He is just answering your question. If you want to make an objection, put it on the record.

Mr. HEMPHILL: Mr. Birney is examining the witness, and I think it is evident he does not wish to answer the question.

A. I wish to be fair in my answer, but to give the proper meaning to the answers, as I said before, I do not see how we can take a single cable partly filled and draw conclusions from what would result from adding subscribers on the vacant wires.

By Mr. BIRNEY:

Q. Take, then, cables with an ultimate capacity of 5,000 and 2,000 subscribers attached to it. Will not the cost of maintenance—that is to say, the care of those cables—decrease per subscriber with the addition of subscribers up to the limit of

5,000? A. We never should put in cables with any such excess of wires as that.

Q. I give those figures as an illustration only. Would not that be the case? A. In just a condition as you have named, without any other conditions, it would seem true that the cost of maintaining cables for 5,000 subscribers, if charged against 2,000 subscribers, in the first place, would decrease per subscriber as you added other subscribers, but this certainly would not be a practical way of figuring such cables or the cost of them.

Mr. BIRNEY: Counsel for complainants object to the
548 last remark of the witness as not responsive to the question.

By Mr. BIRNEY:

Q. At what points, outside of the operating room and the subscribers' stations do you place any increase of cost of service by reason of increase of subscribers? A. At all points.

Q. Where do you find any such increase in the cost of care up to the limit of capacity of the system between the subscriber's stations and the exchange. Please distinguish now in your mind between care and first cost. A. It is evident that it will cost more to maintain and care for 100 line wires than it will for 50 line wires.

Q. At what point do you attach the increased cost? A. I do not understand you.

Q. At what part of the system. Where is it? A. If I understand the question, everywhere.

Q. What tests have you ever made, or what information have you obtained, concerning the increase in cost with increase in number of subscribers between the telephone exchange and the point which may be called the subscriber's station? A. It seems to me that I don't understand your question, because it must be self-evident that when you increase a plant of any kind you increase the cost. It must cost more to maintain a plant for 1,000 subscribers than to maintain a plant for 500 subscribers or for any number less than 1,000 subscribers.

549 Q. Where, between the points I have mentioned, do you find any disproportionate increase of cost of maintenance to the number of subscribers? A. I don't see any disproportionate increase, as I have stated before. I should not say there was any disproportionate increase.

Q. How do you determine that between those points there is any proportionate increase of expense for maintenance? A. It costs twice as much to maintain two wires between a subscriber's station and the central office as it does one wire. Of course I am speaking in a general way. The same pole would carry

two wires as carries one wire, but it must be proportionately larger. One wire extending from the subscriber's station to the central office would break, but would never become crossed with another. Two wires would not only break, but might become crossed with one another.

Q. Given poles of a capacity of 20 wires, it will cost just as much to maintain those poles with ten wires upon them as with twenty wires upon them, will it not? A. If you wish to figure in that way, I should say yes; but you must divide your cost of all wires, of course, with all the business you are doing.

Q. Will the cost per pole line be increased proportionately with the increase up to twenty, the capacity being twen-
550 ty? A. I should say substantially yes.

Q. The cost of the maintenance of the pole line will be increased to double if you increase the wires on those same poles from ten to twenty. Is that what you mean? A. The poles will cost twice as much. Half as much decay would make them dangerous, and they are twice as likely to come down in a sleet storm.

Q. You say the poles for twenty wires will cost twice as much as for ten wires? A. I don't say they will in all cases cost twice as much. I should say they would average in that way somewhere in that proportion.

Q. I have given you poles of a capacity of twenty wires. Now, I ask you, starting with ten wires on those poles, whether it will double the cost of maintenance of those poles to increase the number of wires to twenty? A. I want to answer the question fairly, and yet it is a curious question to answer.

Q. I would like to have an answer to it. A. You assume that we put up poles to carry twenty wires and only put on ten wires.

Q. Yes, sir. A. And then ask if it will cost any more to maintain the poles.

Q. No; I did not say "any more." A. Then I didn't understand you.

The question was repeated as follows:

Q. I have given you poles of a capacity of twenty
551 wires. Now I ask you, starting with ten wires on those poles, whether it will double the cost of maintenance of those poles to increase the number of wires to twenty? A. I should think not.

Q. What would be, in your opinion, if you have formed one, the ratio of increased cost of maintenance? A. I have made no figures which would enable me to give you anything approximate on the cost of maintaining lines under such conditions as you have named. It is not directly to-day under my supervision to build or reconstruct pole lines, but in a large and general way—

Q. I have not asked for this.

Mr. WORTHINGTON: Go on and finish your answer, Mr. Farnham.

A. In a large and general way, the increase of construction outside increases approximately in proportion to the growth of the subscribers.

Q. In what you have just said, do you mean the cost of construction? (To the examiner.) Please note that the witness hesitates. A. I think so.

Q. That, then, is what you refer to? A. I refer to both cost and maintaining.

Q. As I understand you, you find it impossible to separate in your mind the cost of construction from the cost of maintenance? A. I wouldn't say that I don't separate them wholly. I think there is a sense in which one becomes the other.

552 At this point a recess was taken until 8 o'clock p. m.

After recess.

ISAIAH H. FARNHAM resumed the stand for further cross-examination.

By Mr. BIRNEY:

Q. The switchboard with which you are familiar is known as the multiple switchboard, is it not? A. That is one of the switchboards with which I am familiar; yes.

Q. Has the multiple switchboard been discarded in any of the large exchanges for other boards? A. In San Francisco they have, for the time being, at least, discarded the multiple board for a type of divided board, which has been partially invented and experimented with in that city. In Chicago, in one or two offices, the same is true. They are returning in that city, or are about to return, to the multiple board again.

Q. How do you know that? A. I know it from statements that have been made to me. I cannot say exactly how and when and where I learned that.

Q. Or from whom you received the information? A. I cannot say.

Q. As what is that board known; as the divided board? A. That is the term commonly given to it.

Q. How long has it been in use in San Francisco? A.

553 I should say three years.

Q. Have you investigated the cost of that board as compared with the multiple board? A. I have made very few figures in the cost of the apparatus. My study has rather been to determine the efficiency of the board and the comparative number of operators which would be required to do the same

service. In a general way, I know the cost of the apparatus, but I have made no extended figures to compare it with another board.

Q. How greatly, if at all, is the number of multiple jacks reduced in the divided board under the number in the multiple board? A. It depends upon the size of the exchange. It is considerably reduced. The trunk lines—which, by the way, would be increased largely because there must be trunks between individual boards as between different offices, when this class of service is provided, are extended through the several boards as they are in the multiple boards, but the subscribers' lines generally terminate in one board; that is, a portion of the lines terminate in one section of the board, and another portion terminate in another section of the board and so on throughout the office.

Q. Is not the number of jacks on such board reduced to about one-fifth of the number on the multiple board? A. It depends on the size of the office.

Q. Is not the cost of such a board reduced in proportion as the number of multiple jacks is reduced? A. No, it is not, because we find by the increased amount of signal wires
554 and trunk wires and apparatus which is not required on the multiple board that the cost is not so greatly reduced.

Q. In what proportion is it reduced? A. I have already stated that I have made no full and complete figures in regard to this, and that the difference would vary; that the difference in cost would not be the same equally applied to offices of different sizes. I can only answer the question as I have done in a general way.

Q. Are you familiar with the form of board known as the table board? A. I am familiar with some forms known as the table board. One type of the Law board, so called, is a table board.

Q. That also reduces the number of jacks very largely, does it not? A. No; I can't say that it does.

Q. What other boards are you familiar with? A. There are a number of types of divided boards.

Q. Will you now look at the document shown you by counsel for the defendant, being the report of the telephone service in England and the testimony of Mr. Preece, and read that part which I indicate of section 2567 and the answer of Mr. Preece below the pencil mark? A. Page 143, section 2567; and although there may be 150 or 200 operators, each operator is able to put the subscriber who comes into her section into communication with another subscriber that comes into the exchange if that subscriber's wire happens to be free at the time—

555 if it happens to be free. That is the principle of the multiple board. The table form at once sweeps away half the number of jacks, so that on a 10,000 exchange, instead of having half a million jacks you would have only 250,000. I say only 250,000, relatively. That is an enormous number; but in Chicago or one or two other places in America they are now trying what is called a divided board, which reduces the number of jacks to one-fifth instead of one-half, and this divided board is reported upon extremely favorably. It has been worked out principally in Chicago.

Q. I will ask you, Mr. Farnham, to please further read from the testimony of Mr. Preece, section 2944 to 2947, inclusive. A. Page 166, paragraph 2992: "Now, is it not a fact that the present system in Chicago has reduced what I may describe as the jack difficulty to one-fifth.—It has.

"2945. Does not that very largely dispose of your contention that this multiplication of subscribers means an enormous multiplication of cost?—No; only in the first capital cost.

"2946. Just so. We are dealing for the moment with the capital cost.—What I said was this, that with the multiple board the capital cost increased as the square of the number of subscribers.

"2947. Precisely.—That is the effect of the board itself; where you come to the table board, half that is swept away; where you come to the divided board, you come to one-fifth. It is a mere flea bite, practically, in the double expenditure

556 involved in establishing an exchange system. The greater part of the money is expended in constructing the side lines."

Q. Is it not true that the tendency of the improvements being made in telephonic equipment is to cheapen the cost? A. The tendency is everywhere and positively to multiply switchboards of a more expensive type than we have ever had before.

Q. That does not answer my question. Is not the tendency of the improvements generally to reduce the cost of service? A. I don't know how I could answer it better or more clearly. The effort primarily is to give the best possible service to the communities. If incidentally a board can be constructed so that a larger number of subscribers can be handled per operator this is done, and in the boards which are now regarded as the best some gain has been made in this direction; but it is offset wholly or in great measure by the expensive power plants which necessarily accompany this board.

Q. I will now ask you again to read from Mr. Preece's, on page 168, questions 3007 and 3008. A. 3007: "Just passing from the exchange I ought to have asked you another question, when speaking about that. You told us, in answer to Mr.

Benn, that there were great improvements being made as the result of the experience of these exchanges.—Yes.

"3008. Will not a possible effect of those improve-
557 ments be to lessen this increased cost which we have been told increases at such a terrible rate.—The tendency is rather to cheapen."

Q. I now ask you, Mr. Farnham, to read further from the testimony of Mr. Preece on page 168, beginning with section 2991, to the end of section 3000. A. Page 168, paragraph 2991: "They had, I think, a board for every 200 subscribers.—A multiple board is divided into sections, and each section provides for 200 subscribers; so that if you take your multiple board, supposing it is 10,000, and you divide it by 200, you have the number of sections, 50.

"2992. And an income of £10 for using per annum for each of these subscribers, supposing the boards were fully equipped, would give an additional revenue of £20,000 to the company who worked that board? A. Yes.

"2993. Can you tell us what would be the extra cost of putting out this board to accommodate 200 extra subscribers?—I could not give it to you offhand.

"2994. Are you aware that it requires three or four operators to work an additional 200 subscribers?—It would require four operators.

"2995. And would the cost of connecting up by wires be very considerable with the other systems with these 200 additional subscribers?—As I gave it in my evidence in chief that would be pro rata with the number of subscribers.

558 "2996. In what way would the cost be involved? Would it be all wires?—In wires, in fitting up apparatus and subscribers' premises, in wires along the streets or over houses, as the case may be.

"2997. The capital cost of that would not be considerable, would it?—It is the larger portion.

"2998. The actual working cost would only be the wages of those four operators who are girls, I suppose, chiefly.—Yes; but, then, there are additional operators required for working the junction lines that might be involved, and there is clerical labor as well in the exchange; so that the additional four operators would simply be the four operators required to attend to the section during the busy hours. You have to provide for the early duty and the late duty. You have to provide for sickness and for holidays. The number of days of absence through sickness is a very considerable item; so that if you take all these points it is much more than the mere four additional operators that 200 subscribers would involve.

"2999. But of the additional £2,000, which I think you esti-

mated as the income, at £10 per user, is not a large proportion additional revenue which the company would receive?—Yes.

"3000. Can you give us what the proportion would be?—I cannot give you the exact figures, but my impression is that the *whole thing* runs pro rata. If the ratio between revenue and working expenses is so much for 10,000 it will be

559 precisely the same, pro rata, for 200 subscribers."

Q. Mr. Farnham, in your connection with the telephone company, what have you had to do with the practical work of caring for injuries to the plant? A. For the past several years nothing directly with the injuries to the outside plant, but everything connected with the inside plant.

Q. For how long a period have you had nothing to do with the outside plant? A. Substantially nothing since 1885.

Q. What means have you had, then, to inform yourself as an expert of the extent of injury to underground conduits and the causes of injury? A. As I have stated in my testimony several times, my chief duties have been in connection with the inside plant of recent years. I have, however, had the duty of inspecting cables which lay in the conduits, of assisting when difficult problems have occurred in drawing cables into conduits, of studying the matter of electrolysis, which occurs in conduits and manholes. I have been delegated to exchanges when extreme sleet storms have broken the outside plant entirely down, for the purpose of superintending the reconstruction; and of course, in a general way, with the inside apparatus and cables in connection with the outside system, I have been familiar through all these years with the outside plant; and yet not in such familiarity as to make particular figures or answer such questions as you have recently asked, only in a general way.

560 Q. Do sleet storms affect in any way the conduits? A. Ordinarily they do not.

Q. Are you informed of the cost to the Boston company of repairs of injuries caused by workmen in the streets? A. It not infrequently happens that cables are brought in, and my attention is called to cables already in the street where injuries have occurred. In fact, when an injury does occur, it is one of my duties or that of my forces to locate the injury.

Q. That does not answer my question, which refers to cost. A. I attempted to answer it. If you will repeat your question I will try it again.

The question was read as follows:

Q. Are you informed of the cost to the Boston company of repairs of injuries caused by workmen in the streets? A. I do not know the cost of repairs definitely.

Q. Do you know the cost of such repairs to conduits or cables from such injuries in any year? A. I do not.

Q. Is injury caused to conduits or the cables ever by rain storms? A. Generally, no. It may be by the washing out of streets or by the increased action of electrolysis, which the wet earth would favor.

Q. What device do you employ, if any, to prevent electrolysis? A. That subject is a very large one, and the par-
561 ticular methods used for preventing the action differ, depending upon the conditions; that is, the location of the power house which produces the currents which causes the danger, the extent of the system and many other conditions come in to affect the means taken for protection. The principle, broadly, is to provide means for pumping the electric current out of the telephone cables, so that it will pass out into the wet earth which surrounds them.

Q. Can you state the cost to your company of the repairs of its underground system in Boston for injuries arising from any of the causes you have mentioned as contributing to the injury? A. I cannot state the exact cost in dollars and cents. I am well aware, however, of the injury that occurs and the frequency with which repairs and damages are made necessary.

Q. Can you tell how frequently such repairs have been made necessary in the last year through the carelessness of workmen on the streets? A. I cannot give a definite figure, more than to say that it has been frequent.

Q. Mr. Farnham, you have testified that there are toll lines in Boston which you take into consideration in a certain way in your testimony. Will you tell us what proportion those toll lines bear to the unlimited service lines? A. The toll lines which enter the principal offices in Boston bear no direct relation to the local lines. They simply enter the office on a sepa-
rate switchboard for the purpose of enabling any sub-
562 scriber in that office to reach a distant exchange. They are separate and regarded so from the ordinary local service, or from the so-called trunk service, which reaches nearby exchanges.

Q. Then the number you have given us is the number of subscribers—that is to say, 8,000 or 9,000—in the city, means those subscribers with unlimited service—flat rate subscribers? A. It means all subscribers within the busy portion of the city.

Q. And does not include the toll line subscribers? A. There are no toll line subscribers. All of the regular subscribers may use the toll line when they please.

Q. Is your company a dividend paying company? A. It pays dividends.

Q. Do you know how long it has paid dividends? A. Some years. I don't remember just how long.

Q. Did it pay dividends in 1885? A. I can't say. There was

a time when I remember they did not pay dividends. My impression is they did not pay dividends in 1885, but I am not sure.

Q. Can you tell us more nearly when they commenced to pay dividends? A. I cannot tell you the year. My impression is that it was since 1885, and they have paid dividends for some years. That is as near the date as I can fix.

563 Q. Since the company commenced to pay dividends has it paid them annually? A. I think so.

Q. And at the same rate or greater or less? A. I don't remember.

Q. Do you know what was the cost of the whole Boston plant? A. You refer to the principal office?

Q. No; I do not refer to the office at all, but to the whole system in the city. A. I do not. I could not give you any idea.

Q. How did you ascertain the cost of the switchboard? A. By figures I have made and by bills I have approved. I am only giving you the cost of that in rough figures.

Q. Are not switchboards manufactured and sold at regular rates of so much per drop? A. No; the multiple switchboards are not based upon a fixed rate per drop. They could not be, for a large board, as I have already tried to explain, costs much more per drop than a small board, and this cost ever increases as the size of the board increases.

Q. Have you ever used or made any investigation of any other telephone instruments than those manufactured under the patents of the American Bell Telephone Company? A. I have seen, examined and talked with some other instruments. There have been, for instance, infringing instruments taken out in our territory and turned over to us, which have passed through my hands and others I have examined and used sufficiently to form an idea of their usefulness.

564 Q. Have you ever used them in practical work? A. We never have used any other instruments in our exchange business except those procured through the American Bell Telephone Company.

Q. Have you personally ever used them in practical work elsewhere? A. I have just stated that I have used them over lines and as they would be used for commercial business.

Mr. WORTHINGTON: Perhaps it is fair to the witness to say what you mean by practical using. Do you mean using in an exchange or how?

Mr. BIRNEY: Yes; my first question indicated, I think, what I mean—whether he had used them, investigated them and examined them for the purpose of determining their practical use. A. I have done this in a number of instances.

By Mr. BIRNEY:

Q. There are many other telephones now in use, are there not? A. There are other telephones in use. "Many" is a comparative word. I should say, compared with the Bell instruments, there are not many.

Q. Can you give us the comparative cost of cables of 50 pair, 100 pair, 150 pair, and 200 pair capacity? A. I cannot.

Q. Have you ever investigated that? A. I have known the cost of cables as I have known the rental charged, but it is not one of the figures that I need to carry in my mind, and
565 I do not carry the prices of cables. There is a great variety of cables and a great variety of prices.

Q. Mr. Farnham, what do you know of E. Hospitalier, the signer of the article in the Scientific American which you have produced? A. He is a very well-known electrician, and has contributed somewhat to the art of telegraphy, and especially the construction of exchanges, &c.

Q. How long has he been an electrician? A. I could not tell you that.

Q. What office in any societies has he held? A. I cannot tell that.

Q. Have you ever met him? A. I have not.

Q. What other articles than this one have you known him to write? A. I have read articles from his pen a number of times. I cannot cite just now in what particular.

Q. Do you know what experience he has had in telephoning? A. No; I can't tell you definitely. I know he is a prominent telephone man.

Q. Where? A. In France, I believe.

Q. Where in France? A. I can't tell you any more than that about it. I have not followed the man closely.

566 Q. Is he connected with any telephone company in France? A. I don't know whether he is now or not, or ever has been.

Q. How, then, has he become prominent in telephone matters? A. His name is a familiar one among the people who write and take an interest in those matters?

Q. Do you know if he has ever been in this country? A. I don't know.

Q. Who have you ever heard speak of him as an expert? A. I can't tell you that.

Q. You know nothing of him beyond what you have stated? A. The article that has been quoted from to-day shows his knowledge of the business.

Q. That is all you can say concerning your knowledge of Mr. Hospitalier? A. I don't know him personally. I can't tell you very much about him.

Q. Can you tell us any more about him than what you have stated? A. I don't think so.

Redirect examination.

By Mr. WORTHINGTON:

Q. Mr. Farnham, Mr. Birney has had you read from Mr. Preece's testimony a long extract beginning with 2,991 and ending with 3,000, relating to the ratio between revenue and working expenses for 10,000 subscribers, being precisely the
567 same pro rata for 200 subscribers. Will you please read what immediately precedes this extract as indicated by Mr. Birney, namely, sections 2989 and 2990? A. "Page 128, section 2989. "Then they are about the same in London and in Liverpool. The increase of working these boards, you tell us, is in geometrical progression to the number of subscribers.—Of a multiple board.

"2990. Of a multiple board.—Yes."

Q. He states in what you have just read that the increase in expense is in geometrical proportion to the increase in subscribers, and what immediately follows, what Mr. Birney had you read, refers to a pro rata increase. Can you tell us, from what you know of the subject or from what you see there, what is the explanation of this apparent discrepancy? A. I shall have to look it over a little now. I got the impression in reading it before that the pro rata referred to the different lines of the suggested 200 which were to be added, but it is not clear to me without giving it more study.

Q. You have told us, I think, that you are now planning a new switchboard for the Milk street exchange in Boston? A. Yes, sir.

Q. In that connection, have you made any investigation as to the other switchboards in use, to determine what would be on the whole the best system to use in the proposed new board in Boston? A. Not only for determining that, but for determining the question of new boards which we have already put in this year and are now having constructed.

568 Q. In other exchanges? A. Yes; in other exchanges.

Q. Will you tell us whether in that way or in any way you have had occasion to look carefully into the matter of the efficiency and cost and general utility of what Mr. Birney has called the table board, and also what he has called the divided board; and if so, state the result of your investigations? A. Perhaps I could make it most clear by stating that for several years there has been a so-called switchboard committee in the United States made up of engineers from different parts of the country who were specially interested and informed in switch-

board and telephone matters, who met occasionally to compare notes and to examine the best construction of boards and other questions which naturally come in line with this. During more than one of those meetings very much time was spent upon the discussion—

Q. Were you a member of the committee or present? A. I was a member of the committee.

Q. And present at their meetings? A. During all of its sessions I was a member of the committee and present at its meetings. During at least most of the time for two sessions the table board, or, as we called it, the "horizontal board," was most carefully considered. The committee secured witnesses, if we may call them such, from St. Louis, and I believe from Richmond, where that type of board was doing its best work, and a most thorough, careful research was carried on, not only at these meetings, but preliminary to them, and continued by the individuals of the committee after the meetings adjourned.

The results were that the committee was satisfied, I
569 think, practically unanimous in the conclusion that the horizontal type of board was not the best type of board; that the perpendicular was the better type. The reports of that committee dealt at length with the reasons and conditions which it found. Since those meetings the Richmond board has given place to a perpendicular form, and I think the St. Louis board has also been replaced by a perpendicular form. At all events no one competent, so far as I know, in the care of the large exchanges in this country, would consider now the horizontal board, believing it has proved itself not suited as well as the perpendicular board in the uses of the business. Regarding the divided board—

Q. Before you come to that, will you state what is your own opinion as to the efficiency of the table board, and what reasons you have for discarding it in your own mind. A. My view is entirely in accord with the majority, that the table board is not as efficient or as reliable as the perpendicular board. While theoretically it would be possible to place operators on each side of a horizontal board, allowing them to reach upon the same apparatus, it is found practically that the board must be narrower than may be employed in the perpendicular form, in order for the operators to reach. In other words, an operator can reach higher in a sitting position than she can reach forward over a table. Another objection is the snarling or tangling of the cords which are extended from one side of the table to the opposite extreme, and again from the opposite side of the table to the first side. These cords are intermingled
570 and snarl in the busy time of day, so as to make the board undesirable. The wiring beneath the board is

more difficult to get at for repairs; and this form of switchboard catches the dust and lodges it in the working parts much more than is found to be the case in the perpendicular board. These are the chief reasons for discarding this type of board.

Q. What about the table board or horizontal board, as you term it, doing away with one-half the multiple jacks? A. Practically this is not the result. Theoretically, as I say, placing operators on each side of the board, and assume that they can reach over a space as large as they could reach upward, and assume that the trouble from snarling cords would not occur, there would be about that saving in jacks; but practically, it is is not found desirable to work the board in this way or practical to work it in this way.

Q. Will you tell us whether there is anywhere in the world any large exchange with a table board now in use, so far as you know? A. As I said, I think the board at St. Louis, which was one of the largest in this country, has been abandoned. There was such a board also in Philadelphia, and it is either entirely out of use at this day or is being thrown out as rapidly as later types can be provided.

Q. Now tell us about the divided board? A. As to the divided board, the early exchanges were all provided with a divided board. This was the simplest form of construc-
571 tion. We then passed—I say we then passed, speaking of the country at large, most of the exchanges—passed to the multiple board. As I have already stated, the manager at San Francisco, finding the cost of the multiple board so great, determined to experiment further with a divided board, adding new signals and apparatus, which to his mind would overcome at least some of the difficulties which had been found with the divided board. The people at Chicago took up the same idea, and did some experimenting in the same line. I not only corresponded with and examined the figures given by these people, but visited San Francisco and Chicago to study the new board.

Q. The divided board? A. The new divided board; and I considered these types the best types of divided board which have yet been brought out. The result of my examination and similar examinations made by other telephone experts in this country has led to the type of multiple board which is now being introduced very rapidly in the large cities of the country. As I have stated before, such a board will replace the divided boards at Chicago, and in my opinion will eventually supersede the divided board in San Francisco.

Q. Can you give us a description of the divided board and state so that we may understand it what are the objections to it as compared with the multiple board? A. In the early days

of the business it was found that only in the smallest exchanges was the best service procurable; that is, exchanges in which one operator was able to care for all the lines of the sys-
572 tem, perhaps 100 lines. This was evidently because the single operator had to do with each connection. She took the call from the subscriber; she connected his line with the line desired, rang the bell of the subscriber desired and the connection was complete. The larger exchanges at that time resorted to divided boards; that is, a certain number of lines terminate on one operator, another similar number on the next operator, and so on throughout the exchange. Of course the calls of any one subscriber in a large exchange were very largely for subscribers on other sections of board. In making the call the operator received the want of the subscriber, put his line in connection with a trunk line in the office extending to the particular switchboard on which the party called for was located, and then communicated with the operator of this second section or the section on which the desired subscriber was located, and the second operator, in turn, completed the connection by connecting the trunk line with the subscriber desired and ringing the bell. This required more time and caused more errors than with the single operator. The business in many places grew to a condition in which even four operators were involved. In the effort to make the service accurate and rapid methods were employed of making tickets by one operator, passing those tickets to another operator, who put up the connections on the switchboard, and then the ticket was passed to a third operator, who would ring the subscriber's bell and see that the parties began to talk, and when the connection
573 was through the ticket would go to still another operator, who disconnected these calls, until, at one time, it was a saying that a party in Chicago could call for another subscriber and go and take a bath and get back in season to reach the party he wanted. I only name this as illustrating the fact that a long time was necessary on the average to connect two subscribers together. When the multiple board was introduced it at once gave a condition in an exchange of 4,000 as perfect as had been found in a small exchange of 100 subscribers, simply because all of the calls were handled and cared for and completed by a single operator. As I have stated before, time is saved by the use of one operator, and, what is more important, errors are saved. The moment we depart from this fundamental plan of employing but one operator to make the connections that moment we step out into increased troubles and loss of time. That was the experience in the early boards, and that is the experience in the latest divided boards.

Q. I was about to ask you what difference there is, if any,

between the divided board in use in San Francisco in recent years, and the divided board, which you have described as in vogue in the earlier days of telephony in this country. A. There is a marked difference between those two boards. The early board was not in the sense nearly so automatic as the later boards. For instance, in the later boards, after the connection is completed, a subscriber hangs his telephone up, having finished his conversation, and that automatically shows a signal before the two different operators, who immediately disconnect those two lines. Other signals have been introduced in the later boards which overcome some of the difficulties found in the first divided boards; but with the best possible apparatus and methods it has not been found that the divided board is equal, or nearly equal, in efficiency or economy to the best types of multiple boards.

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Q. Is the divided board now in use in any large exchange, so far as you know, except the one in San Francisco? A. That is the largest equipment, and as I have named, in one or two of the branch offices in Chicago, and a type which might be called a compromise between a divided board and a multiple board is in use in Buffalo. Those are the only ones in large exchanges that I call to mind.

Recross-examination.

By Mr. BIRNEY:

Q. Where are these divided boards manufactured, Mr. Farnham? A. The San Francisco board was made up there at San Francisco largely, I think, by the company which is operating it. The Chicago boards were also devised and made up in Chicago, some of the work being done by the Chicago Telephone Company, and some of the work being done by another electrical company in Chicago.

Q. Have you ever personally inspected the Chicago divided board? A. I have.

575

Q. When? A. I inspected it on my return trip from San Francisco, and I have, since that time, visited Chicago and inspected it. I cannot give you the dates. The first trip which involved San Francisco, I think, was three years ago this autumn, and the trip to Chicago since then was perhaps a year ago. In fact, I am not sure but I have made two trips to Chicago since then.

Q. Have there been improvements in the divided board since your trip of three years ago? A. It has been made over and doctored and experimented with almost constantly since its introduction.

Q. That has been also the case with the multiple board, has it not? A. The multiple board has undergone many changes.

Q. By whom was the multiple board manufactured? A. The multiple board is manufactured by the Western Electric Company.

Q. Have you had any recent correspondence with San Francisco touching the efficiency of that board? A. I have not.

Q. Have you had any correspondence with that city on that subject since your visit there three years ago? A. I don't remember that I have had correspondence with them. I have learned of the working of the board since then.

Q. How have you learned it? A. In many ways. I have met the general manager of the company several times in my office in Boston. I have talked with other switchboard
576 men who have visited San Francisco since I was there, and, as naturally would be the case, I have made inquiries frequently in relation to this or any other new large experiment in the telephone line.

Q. I think you said you could not give me the size of the San Francisco board? A. Not nearer than I have given it.

Q. Of how many did this committee of telephone experts on switchboards consist? A. The committee is not now in existence. When it was meeting—

Q. When was that? A. I don't remember the last meeting, but about the time this new divided board was first brought before it was last meeting.

Q. Of how many did it consist? A. Eight or ten, as I remember.

Q. Who appointed them a committee? A. I cannot say.

Q. Who appointed you a member of the committee? A. I received a letter from a Mr. Hall in New York, asking me to meet with such a committee.

Q. Who is Mr. Hall? A. Mr. Hall is an officer of the American Telephone and Telegraph Company.

Q. Was there upon that committee any representative of any telephone company independent of the American Bell Telephone Company? A. I don't know as I can answer that
577 question upon personal knowledge. I don't suppose there was.

Mr. WORTHINGTON: I will ask what is meant by that question, that they were all licensees of the American Bell Telephone Company?

Mr. BIRNEY: Yes. I was going to say, for your information, that as I have found it these other companies were called independent companies generally. The term which I used in the question is generally applied to them? A. I don't think at that time there was any other company operating at any point.

Q. When was the last meeting of that committee? A. I have already stated that I cannot give you the date.

Q. Can you give us the year? A. Perhaps three years ago.
Q. Was it more than that? A. That is as near as I can fix the date.
Q. Where was the meeting? A. The last meeting was held in Boston.
Q. Where were the previous meetings, and how many were there? A. I can't tell you how many. We met a number of times in New York City. We met once, I believe, in Chicago.
Q. Were the meetings at regular intervals? A. No, sir.
Q. How many did you attend? A. All of them.

578 Q. Can you not approximate the number? A. Oh, yes; I can approximate it.

Q. As nearly as you can state it, what was the number of meetings? A. Six or eight, perhaps.
Q. Was there any record made of the conclusions or deliberations of that committee? A. The stenographer took notes. I think some records were made. In fact, I know they were.
Q. Have you any personal knowledge that the divided board in use in Richmond was given up? A. I have not been there in late years, but I am quite sure that it is given up.
Q. When was it in use there? A. It was in use when I was there—I am answering from memory—perhaps about 1890.
Q. When was one of that kind in use in St. Louis? A. I can't give you the dates very near. I have not looked those things up, but a large board of that type was in use there for a long time.
Q. Was that one of the early types? A. The St. Louis board, I am quite sure, was built the second time or a second horizontal board was put in there.
Q. Was that a table board or a divided board? A. A table board.

ISAIAH H. FARNHAM.

Subscribed and sworn to before me, this eleventh day of January, 1898.

JOHN W. HULSE,
Examiner in Chancery.

579 The further taking of these depositions was thereupon adjourned until Wednesday, December 7, 1898, at 3:15 o'clock p. m.

580 WASHINGTON, D. C., December 7, 1896, 4 o'clock p. m.

Met pursuant to adjournment.

Present on behalf of the complainant, Mr. Birney and Mr. Hemphill.
Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

CHARLES W. HASKINS, a witness of lawful age, called by and on behalf of the defendant, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. Mr. Haskins, what is your age? A. 46.

Q. Where do you reside? A. In the city of New York.

Q. What is your business? A. I am a certified public accountant of the State of New York. I am senior member of the firm of Haskins & Sells, of New York City.

Q. What is your vocation or business in general? A. That of a certified public accountant.

Q. What experience have you had as an accountant? A. I have been in this business since January 1st, 1886. I have had a varied experience in the examination of corporations and general business; both before and since 1886 I have been comptroller of the Central of Georgia Railway Co., the Ocean Steamship Co., the Chesapeake & Western Railroad Co., secretary of the Manhattan & Trust Co., and have made investiga-
581 tions of various railroads and industrial corporations, our firm being the auditors of the Erie Railroad, the Philadelphia & Reading Coal & Iron Co., the New York, Susquehanna & Western Railway Co., the Central of Georgia Railway Co., and other corporations.

Q. You speak of having conducted inquiries or investigations into the affairs of corporations. Do you mean investigations into their books of account? A. We have made investigations into their books of account, and also have made physical examinations. Certified public accountant means that we have a law in the State of New York under which a man practices; a certificate is issued by the Regents of the University of the State of New York, and I am the president of a Board of Examiners appointed by the Regents to examine other accountants. And I am also president of the New York State Society of Certified Public Accountants.

Q. Have you had anything to do on behalf of the Government with the examination of the books of the Government departments in the matter of keeping accounts there? A. Yes, sir; I was appointed the chief expert under a joint commission of the Fifty-third Congress, and my partner and myself made the examination into the executive department of the Government, reporting to this joint commission after our investigation, and upon our recommendation bills were put through Congress and a reorganization of the Treasury Department was effected, and also of other departments, the Post Office and In-
terior Departments. The matters recommended by us
582 have been considered an advantage.

Q. Who is the partner to whom you refer, and what is the firm name? A. E. W. Sells, and the firm name is Haskins & Sells. I was also appointed by Mayor Strong as chief expert in charge of the investigation of the departments of the city of New York, which investigation was carried on under my direction for two years. I was also appointed by Comptroller Fitch, of the City of New York, to make an investigation of the borough accounts appropriate to the consolidation of Greater New York.

Q. You mean of the various boroughs? A. Yes; borough accounts.

Q. Which were consolidated in that city? A. In Greater New York.

Q. Is the Government commission of which you have spoken the one of which Mr. Dockery was chairman? A. Yes, sir.

Q. Have you at any time made an investigation into the books of account of the Chesapeake & Potomac Telephone Co., the defendant here? A. Yes, sir.

Q. Will you state, in the first place, how you became to be connected with the matter? A. I was sent for.

Q. State how you were first employed in the matter? A. I
583 was telegraphed for by Senator Faulkner, who acted for a sub-committee of the United States Senate, and I came to Washington, and by instructions from him began an investigation of the books of the Chesapeake & Potomac Telephone Co., so far as its Washington business was concerned, with the aid of one assistant from my office. We proceeded with that examination for two days. At the end of the second day I received a telephone message from Senator Faulkner that the Senate committee had been discharged, and the investigation called off.

Q. Where were you when you received that message? A. I was in Washington. I immediately proceeded to New York.

Q. I wish you would state a little more clearly what was the authority under which Senator Faulkner employed you in the matter? A. He informed me that he was authorized by the United States Senate—that is, his committee was authorized by the United States Senate—to make a thorough investigation of the Telephone Company's books in the District of Columbia, in order to arrive at what was the cost of the telephone service and the revenue of that business, and that he was authorized to employ an expert for that purpose, and that I had been selected after consultation with Senator Allison and other members of the Senate for that particular piece of work.

Q. At the time that Senator Faulkner notified you by telephone that the committee had been discharged from the consideration of that matter, what employment by or what con-

nection with the Telephone Company itself had you
584 had? A. I had not had any, sir.

Q. What occurred then in that matter after you had gone back to New York? A. I received a telephone message from Mr. Bryan, the president of the Telephone Company, asking me if I would continue the investigations which I had begun, on the same lines on which I had started. I replied I would, and immediately came to Washington to continue the examination.

Q. Fix, as nearly as you can, the date when you were employed by the Senate committee, the date when the committee notified you that it had been discharged from the further consideration of the matter, and the date when Mr. Bryan called upon you to continue the investigation for the company? A. I was sent for by Senator Faulkner about March 5th or 6th, 1898, and the work began for the Telephone Company March 11th, 1898.

Q. The date when the committee was discharged from the further consideration of the matter was about March 9th?

Mr. HEMPHILL: I object to that, on the ground that, if the committee was discharged, it can be proved by the official records, and not by the recollection of a witness who claims to have examined the accounts of the whole universe. A. I think that was about the date.

Q. After Mr. Bryan had made this request of you, did you come on to Washington to complete the investigation? A. Yes, sir; I came on accompanied by the same assistant who had accompanied me in the first instance.

585 Q. Who was he? A. Mr. C. S. Ludlam.

Q. Where is he now? A. He is out West.

Q. What is he doing out West? A. He is making an investigation for our firm in the city of St. Louis.

Q. How long were you engaged in the investigation of the affairs of the defendant company which followed? A. I think, sir, for about a period of four months, which included the hearings which took place before the Congressional committee.

Q. Were you engaged continuously? A. Almost continuously, my assistant being here all the time.

Q. Will you state here you made the investigation? A. A small room was set apart for us on the fourth floor of the Telephone Company's building. We had that room to ourselves.

Q. What opportunities or facilities were afforded you for making your inquiry? A. All the records of the Telephone Company were open to our inspection, and we were afforded every facility that the Company had to allow us to get information upon the subject which we were investigating.

Q. Did anybody intrude upon you in the room where you were except when you called for assistance or informa-
586 tion? A. No, sir, we had no interference whatever.

Q. Will you state whether the method which you pursued in making the examination and the manner in which you developed your conclusions were indicated by your own knowledge of the subject, or dictated by somebody else? A. The methods that we employed were methods that we ourselves devised to arrive at the results which seemed in our judgment were required. We had no advice or suggestion from any one else as to any methods which we might employ.

Q. Will you state in what condition you found the accounts of the company and the papers upon which those accounts were based, both as to the system in which the accounts were kept and as to the manner in which that system had been carried out? A. We found the accounts of the company in very good shape, and we found that the system which they used in handling their accounts was a proper one. They were consistent in following out the rules which they had adopted.

Q. In your investigation did you confine yourselves to the books, or did you call for original papers from which the entries in the books were made? A. For the years 1896 and 1897 we went back to the original sources of entry in every item, and verified all the revenue and expenditures of the company in detail for those two years. For the four years prior to those two years we took the books of the company as the basis of the earnings and expenses, making the distribution for those four prior years upon the same basis that we had for
587 the years 1896 and 1897.

Q. In reference to the two years in which you went back to the original transactions will you state what degree of accuracy you found in the books? A. We found the books were practically accurate.

Q. What were the six years which were covered by the statements which you prepared at that time? A. 1892 to 1897, both inclusive.

Q. Have you here a table showing the results which were reached by your investigation of the Company's books for those six years, and if you have, please produce the statements and state what they are? A. (Producing papers) I present here a statement referring to the Chesapeake & Potomac Telephone Co., relating to the Washington plant:

1st: The statement of earnings and expenditures for the six years ended December 31st, 1897.

2d: Statement of income account for the six years ended December 31st, 1897.

3d: Statement of profit and loss account for the six years ended December 31st, 1897.

4th: Statement of earnings and expenses per telephone for the six years ended December 31st, 1897.

Defendant's counsel offers in evidence the above statements, and they are marked respectively, in the way in which the witness has described them, Exhibits "A," "B," "C," and "D."

By Mr. WORTHINGTON:

588 Q. Mr. Haskins, have you recently at the request of the defendant company made another and similar investigation of its books and accounts with reference to a period beginning where the other inquiry left off? That is, say on the 1st of January, 1898, and bringing it down to September 30th, 1898? A. Yes, sir, I made an investigation for the nine months of the year 1898, that is, from January 1st, 1898, to September 30th, 1898.

Q. In what manner was that investigation conducted? A. It was conducted on the same lines as the previous investigation, covering the six years.

Q. And by whom was the investigation made? A. It was made by me personally, with the aid of two assistants.

Q. Have you here, in tabulated form, the result of that inquiry?

The Witness produces a statement for a period covering January 1st, 1898, to September 30th, 1898, corresponding in form with the statements just above mentioned, marked Exhibits "A," "B," "C" and "D" respectively.

Counsel for defendant offers in evidence such statement, and it is marked Exhibit "E." Exhibit "E" is as follows:

EXHIBIT "E."

589 The Chesapeake and Potomac Telephone Company, Washington Plant.

Earnings and General Operating, Maintenance and Construction Expenses. January 1, 1898, to September 30, 1898.

590 THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY—WASHINGTON PLANT.

Statement of Earnings for Nine Months Ended September 30, 1898.

Rentals from Exchange Subscriptions.	$145,696.50
Receipts from Local Pay Stations....	10,864.21
Commissions on Long Distance Business	772.30
Commissions on Messages Collected for the Western Union Telegraph Co...	77.16
Receipts from Toll Service.....	581.45

Extra Territorial Revenue	6,755.75	
Private Line Rentals	4,912.10	
Messenger Service	25.60	
Real Estate	50.00	
Commissions on Messages Distributed for the Western Union Telegraph Co.	21.38	
Loop Rentals, Care Batteries, etc., for the American Telephone & Telegraph Company	814.37	
Moving Telephones	560.81	
Profits on Labor and Material sold	1,171.27	$172,302.90

591 THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY—WASHINGTON PLANT.

Statement of Expenses for Nine Months Ended September 30, 1898.

Maintenance:		
Salaries and Wages	$31,590.29	
Rent, Light and Heat	1,723.59	
Material	18,534.27	
Traveling	1,459.90	
Conduit, Pole and Roof Rental	274.25	
Insurance	227.50	
Damage and Compensation	129.80	
Incidental	417.26	
Total Maintenance Expenses		$54,356.86
Operating:		
Salaries and Wages	11,631.35	
Rent, Light and Heat	1,746.31	
Incidental	343.88	
Total Operating Expenses		13,721.54
General:		
Salaries and Wages	10,859.97	
Rent, Light and Heat	673.64	
Real Estate	203.72	
Traveling	1,617.64	
Postage, Printing and Stationery	2,410.50	
Legal	3,914.73	
Incidental	2,024.53	
Total General Expenses		21,704.73

Rental and Royalties:		
Instrument Rental, American Bell Telephone Company—Exchange.....	10.797.87	
Instrument Rental — American Bell Telephone Company—Private Line.	866.98	
Royalty on Extra Territorial Business.	424.17	
Royalties on Messages handled for the Western Union Telegraph Company	11.22	
Royalties on Switchboard.....	1,385.77	
Total Rentals and Royalties.....		13,485.01
59.93 per cent. of Total Gross Earnings		
Total Expenses.....		103,268.14
Taxes		355.76
Total Expenses and Taxes.....		103,623.90
Net Earnings.....		68,679.00
Per cent. of Expenses and Taxes to Total Gross Earnings		60.14

592 THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY—WASHINGTON PLANT.

Statement of Income Account for Nine Months Ended September 30, 1898.

Receipts.

Net Earnings, as per Exhibit "A".....	$68,679.00

Disbursements.

Bad Accounts Charged off.....	$726.47	
Miscellaneous Interest:		
Washington proportion figured on revenue basis.....	594.02	
Fixed Charges:		
Interest on First Mortgage Bonds—Washington proportion 2-5 of total charge	7,490.00	
Sinking Fund:		
First Mortgage Bonds—Washington proportion 2-5 of total charge.....	7,500.00	16,310.49
Surplus from Operations.....		$52,368.51

EXHIBIT "B."

593 THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY—WASHINGTON PLANT.

Statement of Profit and Loss Account for Nine Months Ended September 30, 1898.

Receipts.

Surplus from Operations, as per Exhibit "B"	52,368.51	
Premium on One Bond Sold $5.00—Washington proportion 2-5	2.00	$52,370.51

Charges.

Dividend Paid on Capital Stock: 3 per cent. on $750,000.00	22,500.00
Surplus for Nine Months	29,870.51

EXHIBIT "C."

594 THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY—WASHINGTON PLANT.

Statement of Earnings and expenses, per telephone, for nine months ended September 30, 1898.

	Nine months period.	Average per annum.
Average number of telephones in use..	2,126	2,126
Rentals from exchange subscriptions..	$145,696.50	
Receipts from local pay stations.....	10,864.21	
Total exchange station income....	$156,560.71	
Private line rentals.....	4,912.10	
Extra territorial and miscellaneous revenue	9,658.32	
Profit on labor and material sold.....	1,171.27	
Total receipts, as per Exhibit "A".	$172,302.90	
Average per telephone.....	81.04	108.05
Expenses and taxes, as per Exhibit "A"	103,623.90	
Income account, expenses " "B"	16,310.49	
Total expenses	119,934.39	
Average per telephone.....	56.41	75.21
Total net income from all business....	52,368.51	
Average per telephone.....	24.63	32.84

595 THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY—WASHINGTON PLANT.

Statement of Earnings and expenses, per telephone, for nine months, ending September 30, '98.

Total receipts from exchange stations, as shown hereon	$156,360.71	
Average per telephone	73.64	98.19
Total expenses, as shown hereon	119,934.39	
Less items not relating to exchange service: Private line expenses, rentals and royalties	917.80	
Royalty on Extra territorial business	424.17	
Royalty on messages handled for the Western Union Telegraph Co.	11.22	
Proportion of expenses applicable to extra territorial and miscellaneous revenue (being the general per centage of expenses to earnings, not including rentals and royalties—52.31 per cent of $9,658.82	5,052.52	
Total deductions—Expenses not applicable to exchange stations	6,405.71	
Total expense exchange stations	113,528.68	
Average per telephone	53.40	71.20
Net earnings exchange stations	43,032.03	
Average per telephone	20.24	26.99

596 THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY—WASHINGTON PLANT.

Statement of Telephones in use from December 31, 1897, *to September* 30, 1898.

	Exchange.	Private lines.
December 31, 1897	2,085	468
January 7, 1898	2,106	468
January 14, "	2,116	472

Statement of Telephones in use from December 31, 1897, to September 30, 1898.—Continued.

		Exchange.	Private lines.
January 21,	"	2,118	474
January 28,	"	2,126	476
February 4,	"	2,131	477
" 11,	"	2,134	477
" 18,	"	2,137	477
" 25,	"	2,139	478
March 4,	"	2,142	480
" 11,	"	2,146	421
" 18,	"	2,150	481
" 25,	"	2,154	481
April 1,	"	2,146	494
" 8,	"	2,152	496
" 15,	"	2,155	494
" 22,	"	2,156	494
" 29,	"	2,159	494
May 6,	"	2,115	499
" 13,	"	2,114	497
" 20,	"	2,117	498
" 27,	"	2,113	498
June 3,	"	2,107	488
597			
" 10,	"	2,101	490
" 17,	"	2,105	487
" 24,	"	2,105	489
July 1,	"	2,135	490
" 8,	"	2,122	490
" 15,	"	2,131	490
" 22,	"	2,120	492
" 29,	"	2,120	492
August 5,	"	2,105	476
" 12,	"	2,111	477
" 19,	"	2,107	477
" 26,	"	2,111	477
Sept. 2,	"	2,114	477
" 9,	"	2,116	479
" 16,	"	2,126	480
" 23,	"	2,135	482
" 30,	"	2,132	485
Total telephones in use, Dec. 31, '97, to September 30, '98, 40 weeks		85,634	19,372
Average telephone in use per week		2,126	484

598 THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.—WASHINGTON PLANT.

Detailed statement of amount expended for construction. January 1, 1898, *to September* 30, 1898.

January, 1898.			
General construction, Georgetown.....		$4,110.75	
Equipment, instruments		1,389.96	
			$5,500.71
February, 1898.			
General construction, Georgetown.....		27.02	
Equipment, instruments		288.65	
			315.67
March, 1898.			
General construction, Georgetown.....		52.41	
Equipment, instruments		488.28	
			540.69
April, 1898.			
Equipment, instruments, Cr....	795.03		
" office furniture...	22.00	Cr. 773.03	
			Cr. 773.03
May, 1898.			
General construction, underground cable		68.89	
Equipment, furniture		273.95	
			342.84
June, 1898.			
General construction, underground cable		1,509.44	
Equipment, instruments, Cr...1,102.32			
" office furniture....	17.50	Cr. 1,084.82	
			424.62
July, 1898.			
General construction, underground cable		233.06	
Equipment, instruments		254.49	
			487.55
August, 1898.			
General construction, underground cable		87.65	
Equipment, instruments	380.97		
" furniture	58.45	439.42	
			527.07

September, 1898.

General construction, underground cable	378.32		
General construction, underground conduits	300.00		
		678.32	
Equipment, instruments.....		652.92	
			1,331.24
Total construction expenses, Jan. 1st to Sept. 30, 1898			8,697.36

599 Q. How do the books of account of the company for the period covered by this last statement compare with those for the preceding six years in respect to the condition in which they are kept, and the system? A. They are in as good condition as in the prior period, sir.

Q. What facilities were afforded you for making this last examination? A. Full facilities.

Q. In making either of these investigations, will you tell us whether you have called upon the company for informati on and papers whenever you thought it would aid your inquiry? A. Yes, sir; we called for all the papers that we thought were needed, and, further than that, would ask for information in regard to certain items, so as to fully understand the items in the books. The information was always freely and cordially extended to us.

Q. I wish to ask you whether at any time anything that you wanted, either in the way of papers, books or information has been refused? A. No, sir.

Q. What do you say as to the correctness of the statements which have just been filed in evidence, marked Exhibits "A," "B," "C," "D" and "E," and as to their showing truthfully and fully what they purport to show as to the affairs of this
600 company? A. The statements are correct as rendered, sir.

Q. Did you also during your first investigation prepare a statement of the work done by the construction department of the telephone company during the years 1892 to 1897, both inclusive? A. Yes, sir; we took the annual reports of the company for the years 1892 to 1897, inclusive, and drew from those annual reports the work that had been done during the respective years. We then found the cost of this work, which cost we found by consulting and working with the superintendent of outside construction.

Q. Mr. Crenshaw? A. Mr. Crenshaw. We verified the prices of specific items, such as poles, wires, &c., adding to such cost the estimated amount for labor. We verified, as far as practicable, the cost of the underground construction. By arriving at these costs it enabled us to make a statement showing the value of the net increase to the plant during that period, 1892 to 1897, inclusive. We accompany this with a statement of the amount that had been charged on the books of the company to construction for that same period, not including amounts charged for switchboards and equipment.

Q. What do you mean by the word "equipment?" A. Equipment or the various appurtenances which belong to the instruments.

The statement concerning which the witness has just testified is produced by him, and offered in evidence by the counsel for the defendant, and marked Exhibit "F."

601 The WITNESS: I desire to explain in regard to this statement that the amount charged for construction on the books for 1892 to 1897, inclusive, does not allow any credit for the plant which has been taken up or abandoned, and the statement which shows the cost of the new work does make such an allowance, as the value of that new work is figured out simply upon the net increase on work done during that period. For instance, there is a credit which shows on the statement of an amount for asphalt conduits abandoned, twenty-eight thousand five hundred and seventy feet, at the cost price, $1,411, making $40,000. This explanation is necessary in order to show the discrepancy between the actual value of the plant added and the amount charged by the books to construction.

Q. What rule, if any, did you find had been observed in making entries in the books of the company as to what should be charged, in new work, to construction and what to maintenance? A. The rule governing the construction department in making their charges was that the cost of the new work in excess of the value of the old work abandoned or taken up should be charged to construction, and it is evidenced that it is intended in their account to follow that rule, but this statement which is rendered for construction shows that they had not followed strictly that rule.

Q. In what respect have they departed from it? A. By not making a credit to construction account and charging the expense account with the value of the old material or old plant taken up or abandoned, such as cables drawn out and

602 abandoned and asphalt conduit abandoned.

Q. What has been the result of that, as to how the construction account stands upon the books of the company? A. For the period from 1892 to 1897, inclusive, it shows that

they have charged to construction account for construction, not including amount for switchboards and equipment, $109,539.74, while for the same period the net value at cost of the addition to the plant less the value of the old plant abandoned is only $52,486.51, showing that there has been charged to construction in excess of the value of the additions to the plant an amount of $57,053.23.

Q. What is your opinion as an accountant as to whether or not the rule which you say the company followed in making the entries in regard to maintenance and construction was a proper rule or not? A. I think it is a proper rule to charge the excess value of the renewals over the old work which it renewed or replaced to construction account and charging all extension of plant to construction account.

Q. Suppose that in any manufacturing or business enterprise a part of the plant is removed and a new construction substituted in its place, the new construction costing more than the old, what are the proper entries? A. It is proper to charge the excess value of the new plant over that which it replaced to construction account, and charge maintenance or any reserve which they may have set up for replacements with the
603 value of the old plant removed.

Q. Suppose the cost of the new work is less than that of the old, what are the proper entries in that case? A. It is all charged to maintenance.

Q. And what is done about the difference between the cost of the new and the cost of the old? A. Where the new is less than the old?

Q. Yes. A. Well, there is nothing done.

Q. In the course of your first investigation of the books of this company, did you also prepare a statement as to the amount expended for construction from the date of purchase of the plant, August 1st, 1883, to December 31st, 1897, and in connection with that a statement as to the sources from which the money expended for construction was obtained? A. Yes, sir; we prepared such a statement.

The witness produces the statement to which he refers, and the same is offered in evidence by counsel for the defendant, and is marked Exhibit "G."

Q. What have you to say as to the correctness of the two statements which have just been offered in evidence, marked Exhibits "F" and "G" respectively? A. They are correct as rendered, and as representing facts shown by the books of the company or deductions made by us from such figures.

Q. You mean inference when you speak of deductions. You had better use the word "inferences."

604 Mr. WILSON: Use the word conclusions.

Q. Use the word conclusions. A. Yes, sir.

Q. Mr. Haskins, perhaps it is all covered by what you have stated, but I will ask you what you have to say as to whether or not the entries which you found in the books of the company referring to charges to construction and to maintenance respectively were proper charges to those accounts? A. I believe that the accounts as kept by the company are practically correct; that they have made every conscientious endeavor to charge maintenance with the proper amount and construction with the proper amount. As shown by this statement of construction for the several years they have not succeeded in being entirely accurate in their charges to construction, as they have failed to charge to maintenance the amount and credit construction with the amount of the plant which has been abandoned. With that exception their accounts are correct as rendered.

At this point a recess was taken until 8:15 p. m.

605 WASHINGTON, D. C., Dec. 7th, 1898, 8:15 o'clock p. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney and Mr. Hemphill.

Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

CHARLES W. HASKINS, recalled for cross-examination, testified as follows:

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Haskins, in the accounts of the company as found upon the books, is there any charge annually for depreciation of plant? A. There has been at various times charges for depreciation.

Q. To what extent, and when? A. By referring to the statement which I have rendered to-day, Exhibit "C," I find that there was a charge made for depreciation on account of the Washington plant, in 1894, of $24,597.33; in 1895 of $20,251.30; in 1896 of $9,012.75.

By Mr. WORTHINGTON:

Q. And in 1897? A. There was none in 1897. The total for the six years from 1892 to 1897, both inclusive, is $53,861.28,
606 which we have not charged into the expense account on the statement as rendered.

By Mr. BIRNEY:

Q. Was that an annual charge? A. No, sir; it was only for those specific years in which it was charged; they did not charge every year.

Q. Before 1892 had charges of that kind been made? A. I do not remember. I am not certain as to that. I think not. I think those were the only depreciation charges.

Q. You are not certain on that subject, however? A. No, sir; I do not remember.

Q. As I understand you, Mr. Haskins, the method found in the books where work was done which took the place of other work was to determine by the cost of the new work as it compared with the old work whether the new work should be charged to construction or maintenance. Am I right? A. The excess cost of the new work over the cost of the old work was to be charged to construction.

Q. Did the question of the increased capacity of the new work enter into the question whether it should be charged to construction or maintenance? A. No, sir.

Q. Have you before you the reports of the president of the company for 1892 and 1897, of which you have spoken as forming part of the basis of your statement? A. Yes, I have.

Q. I want to direct your attention now to the report showing the amount of construction in the Washington territory
607 during the year 1896, and the similar report during the year 1897? A. Yes, sir. I have them both here.

Q. Can you state from those two reports the increased capacity for service caused by the work of 1897? A. My report simply stated the amount of new poles set and the net increase in new poles, referring to Exhibit "F" of this date. The number of feet of aerial cable, the increase in overhead wire and the number of manholes built, and the amount of conduit held and the amount of conduit abandoned. That is what my report states. It states the amount of cable drawn in, the amount of cable drawn out, and the amount of cable and conduit abandoned. It does not state the capacity. Is that the term you use, "capacity?"

Q. Capacity for service. A. It does not state the capacity.

Q. Did you make a comparison of the capacity for service of the plant on the 31st day of December, 1897, and on the 31st day of December, 1896? A. No, sir.

Q. As shown by these reports? A. No, sir.

Q. Was there anything charged to construction in the year 1897? A. Only for equipment.

Q. What do you understand to be meant by equipment? A. The different parts of the telephone instruments which the company themselves supplied, which they do not get from the American Bell Co. under rental agreement.

608 Was anything charged to construction in that year for new poles? A. In 1897?

Q. Yes. A. No, sir.

Q. Or an increased number of manholes? A. No, sir.

Q. Or increased length of wire? A. No, sir.

Q. Or increase in duct feet of conduit? A. No, sir.

Q. Or increase in cable capacity? A. No, sir.

Q. Can you determine by looking at those two reports or by looking at any of the tables that you have what was the increase in capacity that year over the previous year? A. No, sir; I could not determine that.

Q. You did not examine the reports to find out what that was? A. No, sir.

Q. Then, Mr. Haskins, although you should find that the increase in capacity for service in that year was from one-seventh to one-fourth of the whole plant of the company, you would consider it proper that none of that should be carried to construction, provided the cost of it was not in excess of the cost of work which was abandoned? A. I should say so; yes, sir.

609 Q. Although that abandoned work was of inferior capacity? A. I should say so.

Q. That it would not serve so many customers? A. I should think it ought not to be carried to construction.

Q. That would not be taken in any separate account, that increased capacity? A. No, sir. There is nothing which appears in the accounts, or in the construction account, or any of the accounts of the company showing its capacity for doing business.

Q. Are you correct in saying that? Look at the reports which are before you and see for example if those reports do not show. Look at the annual reports. A. The annual reports?

Q. Yes. A. I said the accounts of the company. I did not refer to the annual report.

Q. See if those annual reports do not show an increase in conductor in the cables at the close of the year 1897 over those in use at the close of the year 1896, of the difference between nineteen million three thousand and fifty feet and twenty-three million seven hundred and two thousand and nine hundred and fifty feet? A. It appears at the close of 1897 that the capacity of conductor in underground cable as given is 23, 362,600 feet.

610 By Mr. WORTHINGTON:

Q. Conductor of all kinds? A. Total feet of conductor in underground cable, 23,362,600 feet. That would apparently

be an increase of 4,000,000 feet of conductor in underground cable.

Q. What was the increase in the feet of cable?

Mr. WORTHINGTON: You are asking about cables of all kinds?

Mr. BIRNEY: Yes, length of cable.

A. At the close of 1897 there seems to have been 151,821 feet, total number of feet of cable of all kinds, and 23,702,950 feet, total number of feet of conductor of all kinds.

Q. What was the total number of feet of underground conductor at the end of 1896? A. The total number of feet of underground conductor of all kinds at the close of 1896 was 19,003,050 feet, as given by the annual report.

Q. What is the extent of the underground cable? A. The extent of the underground cable by the annual report appears to be, at end of 1896, 128,418 feet, being the total of underground cable of all kinds. At the close of 1897, as appears by the annual report the total number of feet of cable of all kinds as given is 151,821.

By Mr. WORTHINGTON:

Q. Underground cable? A. No, sir; cable of all kinds.

611 By Mr. BIRNEY:

Q. What was the total number of feet of underground cable at the end of 1897? Is it not stated as 145,014 feet? A. The total number of feet of underground cable is 145,014 feet, at the end of 1897.

Q. What is the difference in miles of wire? A. At the end of 1896 the annual report shows that there was a total of 5,841.3 miles of wire of all kinds.

Q. Now, at the end of 1897? A. At the end of 1897 the annual report shows there was a total of 7,352.5 miles of wire of all kinds.

Q. What was the increase of conduit length on that trench sub-way? A. At the end of 1896, according to the annual report, it is given as 13.5 miles of trench sub-way, making 122.5 miles of duct. The report for the year 1897 gives as the total miles of trench sub-way 15.1 miles, containing 132.2 miles of duct.

Q. What was the comparison of duct in the trench sub-way in two years? A. At the end of 1896, according to the annual report, it was 122.5 miles—

Q. Qive the total in feet. A. At the end of 1896, it appears by the annual report, that the trench sub-way contained 646,735 feet and 6 inches of duct. The report for 1897 shows that at the end of that year the trench sub-way contained

612 697,869 feet and 7 inches of duct.

Q. What was the difference in the number of poles. A. At the end of 1896 the number of poles, the total number of poles, is given by the annual report as 4,244. At the end of 1897 the number of poles is given by the annual report as 5,027.

Q. What was the difference in the number of manholes. A. The number of manholes is given by the annual report for the end of the year 1896 as 152 B. manholes and 41 A. manholes, and the number of manholes as given by the report for 1897 is 182 B. manholes and 41 A. manholes.

Q. All that showed a great increase in service capacity, did it not, Mr. Haskins? A. I am not qualified to pass on that, sir, as to the capacity of the business.

Q. It showed an increase in the plant? A. It showed an increase in the plant, as those figures are set forth in the statement which I have rendered (referring to Exhibit "F").

Q. How much was charged to construction in that year?

Mr. WORTHINGTON: In 1897?

Mr. BIRNEY: Yes.

Mr. WORTHINGTON: You mean referring to the Washington plant?

Mr. BIRNEY: Yes.

A. As I have already testified, there is nothing charged to construction for anything other than equipment. That
613 was about $9,000 as I remember it.

Q. And that term has no reference to any of these items which I have just named to you? A. No, sir.

Q. Did you deteremine the value of the material used in this increased work during the year 1897? A. Yes, sir.

Q. What was the value of the materials used? A. I did not figure out the exact increase for the year 1897, but I included that increase in the statement rendered for the years 1892 to 1897, inclusive. I did not figure out the increase—

By Mr. WORTHINGTON:

Q. In Exhibit "F"? A. In Exhibit "F." I did not figure out the increases of each separate year.

By Mr. BIRNEY:

Q. What was the total value of the material used in those six years? A. The total value of the net increase in the plant was $52,468.51.

Q. What was the total value of the materials employed in work of the kind I have named in my last few questions? Can you state? A. I have not figured that out; no, sir. I figured out the value of the net increase.

Q. When you say "net increase" you mean increase over the cost of the former plant? A. No, sir; I mean that I
614 figured out the value of the increase of the plant itself.

If there were so many feet of cable drawn in and so many feet of cable drawn out, I simply took the difference, the net increase in the plant itself, and figured out the value of that on the basis of cost.

Q. Are you able to say whether between 1892 and 1896 there was any substantial increase in the plant? A. I can simply state that the annual reports show that there was a substantial increase in the plant.

Q. Will you turn to the report of the extent of the plant at the end of the year 1892? A. I have the annual report for the year ended Dec. 31st, 1892.

Q. Please tell me what was the extent of the cable at that time? Of course, I mean in the Washington system? A. It is all set forth in that report.

Mr. WORTHINGTON: You mean all kinds of cable, overhead and underground?

Mr. BIRNEY: Whatever there was. I want to compare it with the cables in 1896.

Mr. WORTHINGTON: You can put those reports in and do your own addition.

Mr. BIRNEY: It might perhaps abridge matters if we can put in the total for the city.

The WITNESS: There seems to be in the annual report for the year ended December 31st, 1892, an amount of 145,310 feet of various aerial and underground cables in use.

615 Mr. BIRNEY: I will put parts of those in.

Mr. WORTHINGTON: We object to parts. If anything goes in we want the whole of them to go in connection with the Washington business.

Mr. BIRNEY: I offer in evidence the statement contained in the report referring to the operations of the company for the year ended December 31st, 1892, paragraph headed "Present Extent and Kind of Line," for the Washington territory; and from the report of Jan. 30th, 1897, showing the work in the Washington territory, I offer the paragraph headed, "Total for City."

The two paragraphs above referred to and offered in evidence by the counsel are marked "complainants' Exhibit 100." Complainants' Exhibit 100 is as follows:

Extract from Report of 1892.—Present Extent and Kinds of Lines—

Number of poles in Washington division outside city limits	2,694
Number of poles in Washington division inside city limits	1,121

Number of house-top fixtures	11
Number of feet of aerial cable, 50-conductor Phillips	600
Number of feet of aerial cable, 50-conductor, Patterson	3,300
Number of feet of underground construction	95,752
Number of manholes (34 "A," 139 "B")	173
Number of feet of underground cable, 50-conductor Phillips	1,178
616 Number of feet of underground cable, 100-conductor, Phillips	873
Number of feet of underground cable, 16-conductor, Phillips	850
Number of feet of underground cable, 50-conductor, Patterson	56,941
Number of feet of underground cable, 100-conductor, Patterson	52,342
Number of feet of underground cable, 50-pair, Patterson	28,961
Number of feet of underground cable, 25-pair, Patterson	125
Number of feet of underground cable, 10-pair Patterson	140
Number of exchange wires in use	1,652
Number of private-line wires in use	39
Number of trunk lines to department switchboards	17
Number of E. T. Lines entering Washington Exchange	2
Number of exchange stations	1,817
Number of P. L. stations (197 belong to District Government)	330
Increase in number of stations during 1892	86
Miles of single wire	1,816 4-5
Miles of wire available in aerial cables	37
Miles of wire available, underground cables	2,111
Total mileage of wire available	3,964 4-5

617 Extraterritorial and other toll business, real estate revenue, and miscellaneous receipts:

The receipts under this head for the year 1892 were $25,310.25.

Extract from Report for 1896.—Total for City.

Total trench sub-way, 71,027 feet 5½ inches, containing 646,735 feet 6 inches of duct; total miles trench sub-way, 13.5, containing 122.5 miles of duct.

There are 152 B manholes, 41 A manholes, 9,045 feet of asphalt trench conduit 1.7 miles, containing 12,590 feet of duct, 2.4 miles.

There are 1,308 poles in the city limits, 2,936 in the county in this division; total, 4,244 in this division, or 120 miles of a

pole line, a decrease of 4 poles up. House-top fixtures up, 8.

There are at present 2,197.3 miles of wire on poles, 45 miles on house-tops; total, 2,242.3 miles aerial wire up, making a total of 5,841.3 miles of wire of all kinds.

Two hundred and seventy-five miles of the aerial wire is No. 12 N. B. S. copper, 591 miles is No. 12 B. and S. copper, 1,376.3 miles is iron and steel; total, 2,242.3 miles aerial wire.

There is provision for 56 100-pair cables to enter exchange. There are 20 100-pair cables entering exchange at present with 4,000 wires, of which 2,091 are in use.

618 Q. How did you reach the value of the old plant? A. In regard to wire I got out the original bill which referred to the purchase of the wire and made an allowance for the labor upon it and for the conduit. I talked over with the superintendent of construction the cost of the work and satisfied myself that the figures were correct.

Q. Then to ascertain the value you took the original cost? A. Yes sir.

Q. Did you deduct anything for depreciation? A. No, sir.

Q. How did you reach the value of the work? A. Of the new work?

Q. No, of the work done in erecting the original plant.

Mr. WORTHINGTON: You mean the labor?

Mr. BIRNEY: Yes, sir.

A. That is what I just answered.

Q. By what process did you reach the value of that labor which you thus added to the cost of the material? A. Well, by calculation with the superintendent of construction, who was familiar with that business, we arrived at an amount that represented the labor that had been used in the construction.

Q. Was there anything on the books to tell you, as an accountant, the cost of the labor on that work? A. On the general books, no, sir. There was on the books of the superintendent of construction.

619 Q. Did you examine those books? A. Yes, sir.

Q. With what care? A. Care to satisfy myself that the figures which I had taken for the cost of the original work and the cost of the new work were correct.

Q. Did you ascertain whether there was any difference in the price of labor when this old work was laid and the price of labor at the present time—or at the time when the new work was laid? A. I took the cost of the labor at the time the work was done. We did not make any average calculations as to what labor was worth. We took the cost of the work.

Q. Did you determine whether there was any difference in the cost of materials? A. There was a very great difference in the cost of the materials, yes, sir.

Q. Materials are cheaper now than they were? A. I should say so, yes, sir, I do not remember any specific item, though.

Q. But in spite of that you took the original cost? A. Yes, sir.

Q. As representing the value at the time, in 1897, when this work was done? A. I did not take it as the value in 1897. I took it as the cost of the old work. The value of the work in 1897 is the new work put down.

620 Q. You deducted from the value of the new work the cost of the old work? A. Yes, sir.

Q. Without making any allowance for difference in cost of materials? A. Without making any allowance for difference in cost of materials between this time and that.

Q. What did you find to be the extent of the Company's indebtedness? A. At what date, sir?

Q. At the time you made your examination. A. I do not think I determined the Company's indebtedness at that time.

Q. Did you find carried into the expense account any charges for interest paid? A. Interest on bonds?

Q. Yes, sir. A. Yes, sir.

Q. Did you also find carried into the same account charges for contributions to the sinking fund? A. Yes, charged into the income account.

Q. Is that charge in the expense account? A. Not in the expense account, no, sir, in the income account.

Q. How did it appear upon the books of the Company, as what account? A. As charged to the sinking fund.

Q. Under what head? A. That particular head, the sinking fund.

621 Q. In making up your tables, did you credit that as an asset, or charge it against the telephones as a part of the expenses of the year? A. In the statement which I rendered it is charged in the income expenditures and is included in the cost per telephone.

Q. That money you found still to be the money of the Company, did you not? A. It is deposited with the trustee. The Company has no control over it.

Q. It is deposited with the trustees to meet the bonds of the Company, is it not? A. Yes, sir.

Q. It is an asset, is it not? A. It is an asset only applicable against the outstanding obligation of the bonds.

Q. In your judgment is it properly chargeable as an expense? A. In computing the expense account per telephone according to the statement which I have rendered it is necessary to include that because it is a necessary expense of the company.

Q. And yet it remains an asset? A. It remains an asset sim-

ply to provide against that particular one obligation. It is not a general asset of the Company.

Q. In ascertaining the cost of maintenance, did you charge in any part of the cost of equipment? A. No, sir.

622 Q. None? A. No, sir.

Q. Where did you charge that? A. Equipment is charged to construction account.

Q. Is that so upon the books of the Company? A. Yes, sir.

Q. And what did you understand to be equipment? A. The parts of the telephone instruments which are owned by this company.

Q. Of the instruments themselves? A. The instruments themselves, yes, sir, except those parts which they get from the American Bell Co., as the transmitter.

Q. But you say that the cost of the magneto bell and the labor of putting it up in the subscriber's station—those are charged on the books of the Company to construction? A. I said that the cost of those instruments was charged to construction. I did not say that the labor of putting them up was charged to construction.

Q. Where was that charged? A. To maintenance.

Q. And that, in your opinion, was right? A. Yes, sir.

Q. What else in connection with the instrument was charged to maintenance, Mr. Haskins? A. The wiring of the house and the connecting of the instrument with the distributing

623 pole.

Q. Can you explain why that should be charged to maintenance any more than cables outside should be charged to maintenance? A. Because it is a specific expense incurred to put the instrument in that one subscriber's house, which he may give up at the end of a short period, and all that work, except the instrument itself, would be valueless.

Q. And if all the subscribers should give up, the system outside would be valueless, would it not? A. I should assume that it would be so.

Q. That might happen too? A. It might happen.

Q. Where there is a continuing system of 2,000 telephones each year for a number of years, you think it would still be right to charge against maintenance the cost of putting each one of those 2,000 telephones up? A. I think so, yes, sir.

Q. For the same reason that you think it might be temporary? A. Yes, sir.

Q. That is, because of the risk that it would be temporary? A. The risk that it would be temporary, yes, sir.

Q. And that would continue to be right, although experience should prove that it was in fact permanent? A. You have got to start out with some system of keeping your ac-

counts, and you cannot change it after you have proved something else. If, after a large number of years all those were permanent subscribers you might assume then it would
624 have been better to charge to construction in the first place, but that is not proved when you make the charge.

Q. Did you ascertain the average cost of that work? A. Of installing instruments?

Q. Yes, sir. A. No, sir.

Q. How much did you charge against maintenance for that kind of work in 1897? A. I could not tell you that, sir. I have not the distribution of the maintenance charges.

Q. Please look at Exhibit "E," and under the statement of expenses for the nine months ended September 30th, 1898, and under the sub-head "Maintenance" tell me how you arrived at the charge of $31,590.29 of salaries and wages as chargeable to maintenance? A. That is a distribution that appears on the Company's books, it comes from the pay rolls, principally.

Q. How much of the salaries and wages was charged to construction, if any? A. I did not analyze that, sir. The same exhibit shows the total construction charges from January 1st to September 30th, 1898.

Q. All that you did was to take these figures from the books? A. I examined the vouchers and the pay rolls and the material reports in order to see that they had made the proper distribution.

625 Q. Did any part of the salaries of the officers of the company go into that construction account? A. None of the general officers, no, sir.

Q. Did any of the salaries of any of the officers go into that construction account? A. I think there was a portion of the salary of the superintendent.

Q. What portion? A. I could not tell you that, sir.

Q. Was that the only part of the salary that went in? A. That is my recollection.

Q. Did you examine to find out what work was included in this item of $8,627.35 of construction expense? A. No, sir.

Q. You have simply accepted the statement made on the books that that much had been spent for construction? A. For construction. I do not know what particular construction it represented other than is stated on the statement itself.

Q. And the items above that on the same sheet under general construction—is your answer the same as to those? A. Yes, sir. I will state that in making up this statement I was obliged to confer with the superintendent of construction to get the details, to get as much information as I could; this shows more in detail here than it does on the general books. The superintendent has records of what work was being done at the time, which the general books do not show.

626 Q. When you wanted to learn from him what construction had been done did you only ask him what construction had been done? A. No, sir; we looked at his books and records. He has records of what the men were doing.

Q. Did you go over that and determine whether they were proper charges for construction? A. No, sir, only from his records.

Q. And you could not tell from anything that you did whether those items were properly charged to maintenance or construction? A. No, sir, any more than a general conclusion that there was an effort made to distribute that properly.

Q. You took it for granted that what he was telling you was all right? A. Yes, sir.

Q. On the same page of the same exhibit there are noted in red ink some credits of office furniture in one place and in another place equipment, instruments, credited. Will you explain what is meant by that? A. The office furniture is not in red, that is debit. The credit is equipment, instruments, and those are instruments which have been returned and are useless.

Q. What do you mean by "useless?" A. They are either destroyed or returned to stock. The instruments are put back in stock, the instruments returned are not in use by the Company.

627 Q. New instruments? A. No, I think those were old instruments, taken down, in some cases useless, and in other cases there are some instruments that have been returned to stock.

Q. The words "equipment, instruments," as they appear on that statement—do they mean equipment and instrument? A. No, sir, that refers to instruments. That is just an explanation of the word "equipments," it means instruments.

Q. Then in this statement you have charged the setting up of the instruments to construction? A. No, sir.

Q. Is not this an account of construction? A. Sir?

Q. Is not this an account of construction? A. It is construction as charged under the rules and regulations of the Company. The cost of the setting up of the instruments, as I have already stated, is not charged to construction. It is merely the cost of the instrument.

Q. Does this mean instruments set up during the period named? A. Yes, sir.

Q. It is the cost of instruments set up? A. The cost of the instruments, yes, sir.

Q. Do the books show the number, or does your statement show, of instruments in use? A. It does on the average, yes, sir. The same exhibit shows the statement of telephones in use during the present year to September 30th, and it shows

the gradual increase each month. Some months they run down, you notice.

628 Q. Upon what theory, Mr. Haskins, did you in this exhibit "E" under the head of "Disbursements," adopt two-fifths of fixed charges, and of the sinking fund, as chargeable to Washington? A. That is a proportion which I arrived at when I made up the original statement, by taking the total cost of construction in Maryland and the total cost of construction in the District of Columbia, and I found that the proportion of total cost was about two-fifths for the District of Columbia.

Q. Of original cost? A. The cost of construction at the time I made the proportion.

Q. Then you adopted for that reason this proportion of two-fifths? A. Yes, sir, it is an estimate.

Q. Is there anything on the books to show what part of the proceeds of the bonds mentioned in these two items was used in the city of Washington? A. No, sir.

Q. Then, is there anything to show that any of it was used in the District of Columbia? There is no separation of

629 the account as between the Maryland district and the District of Columbia district. The proceeds were used for the general purposes of the Company.

Q. How did you arrive at that conclusion, Mr. Haskins? A. Well, the accounts will show.

Q. Show what the bonds were used for A. Yes, sir; used for the treasury of the Company.

Q. For the general treasury A. Yes, sir.

Q. Do the accounts show any specific use to which these proceeds were put? A. They paid off the indebtedness of the Company.

Q. What indebtedness? A. There was considerable indebtedness at the time the bonds were issued—borrowed money.

Q. When were the bonds first issued? A. They were issued June 9 and 10, 1891.

Q. And the second issue? A. The second issue was December 23, 1897.

Q. What was the amount of the first issue? A. The first issue was four hundred thousand dollars.

Q. At what rate of interest? A. Five per cent. They were sold at 90 per cent. of their par value.

Q. Do you know for what purpose the money was used? A. No, sir.

630 Q. You do not know whether the bonds related to the City of Washington or not? A. The books do not show that they related to any specific part of the business.

Q. There was nothing to show you whether they related to

the City of Washington or were an expense incurred in establishing the plant in other places? A. No, sir; the proceeds of those bonds went into the treasury of the company, and it was expended in the ordinary way.

Q. You say it was used to pay the debts of the company? A. It was used to pay the debts of the company; yes, sir.

Q. What those debts were you do not know? A. I know the books show what the debts were; yes, sir.

Q. Have you made up any statement of the debts? A. No, sir.

Q What did you find to be the capital stock of the Chesapeake & Potomac Telephone Company? A. Pertaining to the District of Columbia, $750,000.

Q. How did you ascertain that? A. That was the amount of stock that was issued to give to the stockholders of the old concern, and it is allotted in that way, $750,000, for the District of Columbia plant.

Q. What is the capital stock of the company? A. $2,-
631 650,000, I think, to my recollection.

Q. Is there anything on the books to show why the $750,000 of that sum was allotted to the District of Columbia? A. The books of the company show that allotment.

Q. In what terms? A. In the original entries setting up the capital stock as a liability.

Q. What does that entry say? A. I could not tell you offhand, but it says that $750,000 of this capital stock relates to the Telephone Company of the District of Columbia. It is set forth in the journal of the company.

Q. Was that whole issue paid to the old company, by which I understand you mean the predecessor in business of this company? A. Was it paid to them?

Q. Yes, sir. A. I suppose so; it so states on the journal. I assume it was paid them.

Q. Does Exhibit "G" show the entire amount which was realized from that capital stock? A. Yes, sir.

Q. That was how much? A. $77,334.93.

Q. Do you find that there was ever any more than that contributed directly by the stockholders to the construction of the Washington plant? A. No, sir.

632 Q. Mr. Haskins, in the investigation you made last spring, you made, in addition to the statements which have been put in evidence to-day, a statement showing the actual cost of construction to December 31, 1897, beginning with 1881, did you not? A. Yes, sir; I made such a statement.

Q. You ascertained from the books, I take it, that the predecessors of the Chesapeake & Potomac Telephone Company were the National Telephone Company of West Virginia and the National Telephone Company of New York? A. Yes, sir.

Q. (Showing statement) Is the statement I now show you a statement made by you showing the cost of construction as well by those two companies as by the Chesapeake & Potomac Telephone Company? A. Yes, sir.

Q. That is a correct statement as taken from the books? A. Yes, sir.

Mr. BIRNEY: We offer it in evidence.

The statement above referred to by counsel for complainant is marked complainant's Exhibit "101."

Complainant's Exhibit "101" is as follows:

633 THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY—WASHINGTON PLANT.

Actual cost of construction to December 31, 1897.

1881.

Aug. 1	Amount expended by the National Telephone Company, of New York, for plant constructed to date (not including franchise, licenses, good will, etc.).....	$32,549.81

1883.

July 31.	Amount expended by the National Telephone Company, of West Virginia, in actual construction from August 1, 1881, to date (not including franchises, licenses, good will etc.).....	58,580.40
Aug. 1.	Actual cost of constructed plant to this date	91,130.21
	The plant sold to the Chesapeake & Potomac Telephone Company, together with franchises, licenses, and right of way, valued at $425,160.21, and cash material, and supplies and accounts receivable, amounting to $92,448.25, for $750,000 in stock of the new company and the assumption by the new company of $15,113.32 of debts.	

634 1897.

Dec. 31.	Amount expended by the Chesapeake & Potomac Telephone Company in actual construction from August 1, 1883, to December 31, 1897.....	441,426.50
	Total cost of Washington plant to date.	532,556.76

	Amount expended by the Chesapeake Telephone Company for real estate from December 31, 1897:		
	Lot 32, Square 220	$30,044.50	
	Lots 40, 41 and 42, Square 252	6,109.89	
			36,154.39
	Total construction expenses at Washington to date		568,711.15
	Working assets:		
	Cash, average monthly balance, $8,815, of which two-fifths on the basis of receipts and expenses is applicable to the Washington plant	3,526.00	
	Material and supplies	18,500.00	
635			22,026.00
	Total investment, not including any charge for franchises, licenses, right of way, or good will		590,737.15
	Capital obligations:		
	Capital stock issued for Washington plant	750,000.00	
	Bonded debt:		
	Total issue	500,000.00	
	Less bonds in the treasury and in the sinking fund	127,000.00	
	Outstanding	373,000.00	
	Two-fifths applicable to Washington plant, said two-fifths being the proportion which the amount expended for construction in Washington bears to the total amount expended for construction purposes by the company	149,000.00	
636	Total capital outstanding		899,200.00
	Actual cost of investment as above		590,737.15
	Leaving for cost of franchises, licences, right of way, good will, etc		308,462.85

Consideration for which $750,000 of capital stock was originally issued:

$750,000 issued August 1, 1883, for the following consideration:

Cash		$79,601.79
Accounts receivable		9,128.22
Supplies		3,618.24
Stock, National Fair Association, 1 share		100.00
		92,448.25
Less accounts payable		15,113.32
Net cash assets		77,334.93
Cost of actual construction of plant prior to August 1, 1883, valued at $118,580.40 on old company's books		90,130.21
Franchises, licenses, right of way, etc., valued at $425,160.21 on old company's books		$581,534.86
Total		750,000.00

638 Q. You also prepared a statement showing the surplus resulting from the business of the Washington plant for the years 1891 to 1897 inclusive? A. Yes, sir.

Q. (Showing statement) And the paper I am now showing you is that statement.

Mr. BIRNEY: We offer it in evidence.

The paper above referred to by the witness is marked complainant's Exhibit "102."

Complainant's Exhibit "102" is as follows:

639 Surplus resulting from the business of the Washington plant for the years 1891 to 1897, inclusive:

1891. Earnings and miscellaneous income			$157,851.52
Expenses	$107,026.92		
Dividends	22,500.00		
			130,203.92
Surplus for year 1891			27,647.60
1892. Earnings and miscellaneous income			180,033.76
Expenses	107,026.33		
Dividends	15,000.00		
			122,026.33
Surplus for year 1892			58,007.43
1893. Earnings and miscellaneous income			195,535.94

	Expenses	120,445.86	
	Dividends	18,750.00	
			139,195.86
	Surplus for year 1893		56,340.08
640	1894. Earnings and miscellaneous income		192,289.60
	Expenses	129,045.89	
	Depreciation charged off	24,597.33	
	Dividends	15,000.00	
			168,643.22
	Surplus for year 1894		23,646.38
	1895. Earnings and miscellaneous income		194,119.57
	Expenses	108,102.75	
	Depreciation charged off	20,251.20	
	Dividends	15,000.00	
			143,353.95
	Surplus for year 1895		50,765.62
	1896. Earnings and miscellaneous income		194,126.06
	Expenses	121,794.34	
	Depreciation charged off	9,012.75	
	Dividends	22,500.00	
			153,307.09
641	Surplus for year 1896		40,818.97
	1897. Earnings and miscellaneous income		207,617.64
	Expenses	186,616.79	
	Dividends	30,000.00	
			216,616.79
	Deficit for year 1897		8,999.15
	Total surplus for seven years—1891 to 1897, inclusive		$248,226.93

642 Redirect examination.

By Mr. WORTHINGTON:

Q. In the statement which you have made, and which has been filed here to-day showing the receipts and expenses per telephone, did you make any allowance for interest on the investment of the company in its plant? A. No, sir.

Q. Did you make any allowance for disasters, such by fire or floods or extensive law suits? A. No, sir; I made no such allowance for any such contingency.

Q. Did you make any allowance for depreciation in the plant or any part of it? A. No, sir.

Q. Mr. Birney has asked you as to what has been done in reference to charging to maintenance substituted plant of greater capacity than the part of the plant which was abandoned. Is there any departure in that course from the custom of business generally, so far as this matter has come under your observation as an accountant? A. I think not, sir.

Q. Referring to the annual report made by the president of the company to its stockholders for the year ending December 31, 1896, you gave the total trench subway at that time as 646,735 feet and 6 inches of duct, or 122.5 miles. Will you please look at the next item in that report and state whether it does not appear that there was 9,045 feet of asphalt trench conduit? A. There appear to have been 9,045 feet of asphalt trench conduit.

643

Q. You have stated on cross-examination that you made no allowance for the difference in cost of material and labor at the time the work of construction was done during the several years mentioned until now. Why didn't you? A. In construction account it would be charged at the cost price, and if the work is abandoned it is proper to credit construction account at the price at which it was charged.

Q. While we are on the subject of construction account, suppose that there are on an average of about 2,000 subscribers to a telephone exchange for a long period of years, but that the membership is constantly changing. What would be the effect of charging all the expense of setting up telephones in the places of business of subscribers to construction. Would you not in the end have, say 10,000 telephones on your books, where as a matter of fact you would have only 2,000 subscribers? A. The construction account would be charged with the work of putting the telephones in, and you would have nothing to show for that amount expended, nothing whatever in your plant to show for it.

Q. Would it be anything like the case of a manufacturing establishment whose manufactory should be burned down and they should rebuild it and charge both the old building and the new building to construction? A. That would be an improper charge.

644

Q. Would not that be the same principle as Mr. Birney seems to contend should be done in this case?

Mr. BIRNEY: That is objected to as a mere inference. A. The last you referred to was the installation of instruments. Are you referring to that?

Q. I am referring to his general principle that everything should be charged to construction. A. I think that would be just as improper in one case as in the other—improper in both.

Q. You have stated, as I understand you, that in preparing

the material for the paper which is Exhibit E in this case, you examined the books and papers of the company to satisfy yourself that they were making a proper distribution of the amounts paid for material and labor as between construction and maintenance? A. Yes, sir.

Q. And you said that was especially so as to wages. Did you ascertain whether or not when wages had been paid the laborers engaged in what was properly construction, that it was chargeable to construction? A. No, sir.

645 Q. You did not do that? A. I did not examine as to what the men were engaged upon, except in a general way in the office of the superintendent of construction.

Q. Did you not in a general way find that there were items of labor charged to construction? A. Yes, sir; I found it charged on the pay roll.

Q. I understood you to say in reply to a question by Mr. Birney that books show that the total amount received by the defendant company for this $750,000 allotted to Washington was $77,334.93. Please look at Exhibit 101 and state what is the consideration which appears to have been received by this company for this $750,000 worth of stock allotted to Washington? A. The consideration was cash, $79,601.79; accounts receivable, $9,128.22; supplies, $3,618.24; stock of the National Fair Association, 1 share, $100; total, $92,448.25. Less accounts payable, $15,113.32, making net cash assets $77,334.93.

Q. Then did your answer to Mr. Birney refer to cash assets? A. Only cash assets. In addition there was the cost of construction of plant prior to August 1, 1883, which was valued on the old company's books, $118,580.40—$91,130.21. Franchises, licenses, rights of way, etc., valued at $425,160.21 on all company's books—$581,534.36; making a total of $750,000.00.

Q. Then according to those entries, did not this com-
646 pany receive for that $750,000 in stock: 1st, $77,000 in cash assets; 2nd, the plant of the telephone company here which it bought out; and, third, the rights of that company under its contract with the Bell Telephone Company in the District of Columbia? A. Yes, sir. That is the consideration they received for the capital stock of $750,000.

Recross-examination.

By Mr. BIRNEY:

Q. Referring again to Exhibit 101, is there anything on the books to show that the old company, the predecessor of the Chesapeake & Potomac Telephone Company, actually paid the Chesapeake and Potomac Telephone Company $79,000? A. Yes, sir.

Q. Was that paid by the old company or by someone else?

A. It was turned over to the new company from the old company.

Q. From the old company? A. Yes, sir.

Q. And in addition to that money they received the
647 plant? A. Yes, sir, upon which there had been expended in cash $91,000 by the prior company.

Q. Did you examine the books of the old company, the predecessor? A. Yes, sir.

Q. Did those books show that that company at the time it went out of existence had as much as $79,000 cash? A. Yes, sir.

Q. They did show that? A. Yes, sir.

Q. Did you see any bank book or other book of that kind to indicate where such cash was? A. No, sir.

The WITNESS: In regard to the credit for equipment, when the construction account is credited they take the instruments back into stock, they carry their stock accounts on their books. I mean that when they make a disconnection they take instruments back into the stock and credit construction account.

C. H. HASKINS.

Sworn and subscribed to before me this 14th day of December, 1898.

JOHN W. HULSE,
Examiner in Chancery.

Adjourned to meet at 8 o'clock p. m. on Thursday, December 8th, 1898.

648 WASHINGTON, D. C., Dec. 8th, 1898, 8 o'clock p. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney and Mr. Hemphill.

Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

JULIUS EDWARD DE SAULES, called as a witness by and on behalf of the defendant, having been first duly sworn, testified as follows:

By Mr. WORTHINGTON:

Q. Mr. De Saules, what is your age? A. Forty-five.

Q. Where do you reside? A. 1012 Twenty-sixth street, Washington.

Q. What is your occupation? A. At present I am chief clerk in the auditor's office of the Chesapeake & Potomac Telephone Co.

Q. How long have you been in the auditor's office of that

company? A. I was transferred to the auditor's office in September, 1894.

Q. And have you been connected with it ever since? A. Yes, sir.

Q. Who is the auditor of the company at present? A.
649 H. W. Bulkley.

Q. When did he take that position? A. September, 1898.

Q. Had he been in the employ of the company before? A. No, sir.

Q. In the auditing department? A. No, sir.

Q. Prior to that time who had charge of the auditing department? That is, prior to September, 1898. A. From June 26th, 1898, until September, 1898, I was acting auditor of the Chesapeake & Potomac Telephone Co.

Q. Prior to June, 1898, who was in charge? A. From November, 1894, to June, 1896, Major Robert Carruthers was in charge.

Q. In what capacity were you in the office during that period? A. Chief clerk of the auditing office.

Q. What are the duties of the office you have styled that of auditor of the company? A. The auditor of the company has general supervision of the accounts of the company.

Q. Has the auditor anything to do with the keeping of the books of account? A. Yes, sir; as far as the general books of the company are concerned.

Q. Are you familiar with those books of account that have been kept during the last six or eight years? A. Since September, 1894, when I went in the office.

650 Q. Who was in charge of the auditor's office at the time Mr. Haskins made his examination of the books last spring? A. I was.

Q. During the time that you were in charge of the office will you please tell us what degree of accuracy, so far as you know, was used in keeping the books of account of the company? A. I think the utmost care was exercised.

Q. What experience, if any, had you had as an accountant before you went there in 1894? A. I was employed in the Treasury for seventeen years before that.

Q. From your general knowledge of the subject, and from your acquaintance with the books, will you tell us what is your opinion as to whether the system of bookkeeping which was followed was a good one for the business or not? A. It was, sir.

Q. In the course of your business have you been called upon to examine the books or accounts of the company which were kept prior to 1894? A. No, sir; not to any great extent.

Q. You have referred to them occasionally, have you not? A. Occasionally, yes, sir.

Q. So far as your knowledge of those books goes, will you please tell us whether or not they were kept in the same system, and accurately kept? A. Yes, sir; they were.

651 Q. How many employees are there in the auditor's office at the present time, including the auditor? A. There are nine.

Q. Please state their duties in a general way and their respective salaries or compensation? A. Do you want me to commence with the auditor?

Q. Yes. A. Auditor, $2,000 a year; chief clerk, $1,500.

Q. That is yourself? A. Yes, sir. Four clerks, at $800 per annum; two at $10 per week, and one at $6 per week.

Q. Has that been about the force in the auditor's office at any time you have been connected with it, or has it been increased or decreased since 1894? A. I think it has increased about two clerks.

Q. What is your opinion as to whether since 1894 the number of employees could have been diminished or the salaries reduced without injury to the proper business of the office? A. I do not think it could, sir.

Q. What is your judgment as to whether there is any useless keeping of books or accounts there? A. I do not think so.

Q. During the time that Mr. Haskins was employed in his investigation what assistance or aid, if any, did you render him? A. I gave Mr. Haskins all the books and papers of the company and answered quite a good many questions as to the way we kept the books, and explained the entries to

652 him as far as I could.

Q. Will you state whether there was any entry mentioned that he asked for or any books or papers he asked to see when his request was not promptly complied with? A. No, sir; there were none.

Cross-examination.

By Mr. BIRNEY:

Q. How long was Mr. Haskins engaged in his latest examination? A. The last one?

Mr. WORTHINGTON: The one for 1898.

The WITNESS: I do not remember exactly now. I should judge about two weeks.

Q. When? A. In the latter part of November.

Re-direct examination.

By Mr. WORTHINGTON:

Q. Have you here a list showing the employees of the defendant company in the latter part of March, 1898, at the time information was called for by the Congressional Committee? A. Yes, sir.

The witness produces the statement referred to and it is offered in evidence by counsel for the defendant, and it is markd Exhibit "H."

653 Q. Have you also produced a similar list as to the employees of the company as they stood on the 1st of July, 1898? A. Yes, sir.

The witness produces the statement referred to, and it is offered in evidence by counsel for defendant, and marked Exhibit "I."

Q. Have you produced a similar statement as to the employees of the company on September 30th, 1890? A. Yes, sir.

The witness produces the statement referred to, and it is offered in evidence by counsel for the defendant, and marked Exhibit "K."

J. E. DeSAULES.

Subscribed and sworn to before me this 11th day of January, 1899.

JOHN W. HULSE,
Examiner.

AUGUSTUS P. CRENSHAW, recalled for further direct examination, testified as follows:

Direct examination resumed.

By Mr. WORTHINGTON:

Q. Since you were upon the stand certain parts of the annual report made by the president of the company to the board of directors have been put in evidence and referred to, tending to show that crtain new work was done in 1897 which should have been charged to construction, and which was not so charged. As these items refer to the branch of the work of which you had charge during that period, I propose to ask you what, if any, explanation you have made of those matters.

654 In the first place it has been shown by the annual report for the year ending December 31st, 1897, that during 1897 there were ninety-four new poles set in the city limits, 691 new poles set in the country, and 131 old poles replaced with new poles in the city, 221 old poles replaced with new ones in the country, two old poles abandoned in the city, being of no further use, and 59 poles removed on account of improvements, etc., making an increase of 783 poles during the year, while it appears that no charge was made to construction on account of any of these poles during the year. Will you please state if that is so, and if so, why? A. It is

apparent that there was an increase in the actual number of poles owned by this company and in explanation of that I will make the following statement:

This company, together with the Postal Co., occupied for a number of years a line of poles on the Woodley Road from Nineteenth and Florida Ave. to the Tennellytown Road. Those poles, while they were jointly occupied, were carried in the name of the Postal Telegraph Co., both companies, however, maintained them jointly. When the line got in such a dilapidated condition, it was found necessary to rebuild it. This company and the Postal Telegraph Co. entered into a joint agreement by which each company became joint owners in the pole line, this company to rebuild the line, each company bearing half of the cost. In other words, the Postal Co., to pay back to this company half of the cost of rebuilding the line. That made it necessary for me to show those poles in this company's yearly statement, as they had not been shown before up to that time. In rebuilding this line jointly with
655 the Postal Co., there were 122 poles set. This company set a new line of small poles, what we term a branch line, into Suitland, Maryland, for the use of a subscriber at that place. These branch lines are always charged to maintenance on the principle of their being thrown out of service should the subscriber for whom they are built drop his telephone service, which in this special case occurred. In building this line there were used 154 poles. This company also set 12 poles at various points to reach different subscribers' residences off the main line, making a total so far of 233 poles set in the county outside of the city limits by the Chesapeake & Potomac Telephone Co.

Q. This is in 1897? A. I am explaining about 1897. The increase of 691 poles in the county in 1897 is further accounted for by the fact that the American Telephone & Telegraph Co., being desirous of getting wires around Washington, so as to reach Norfolk, Richmond and the South, and having no authority to build through the District, erected a line of poles in this company's name so as to make this connection. In so doing the following poles were set by the above-mentioned American Telephone & Telegraph Co.: On the Military Road west from Brightwood, 25 poles; on Nebraska Ave. from the Loughborough Road in a northerly direction, 11 poles; from the Bunker Hill and Queen's Chapel Roads to Brightwood, 170 poles; on Piney Branch Road, from Piney Branch to Mt. Pleasant, 17 poles; from Tennalleytown and Loughborough Road to Chain Bridge, 123 poles; on Piney Branch Road between Piney Branch Bridge and Brightwood, in rebuilding a line
656 owned by this company, they used 165 poles in place of 108 poles, making an increase of 57 poles, and making

a total amount of new poles erected by the American Telephone & Telegraph Co. for this company, 346 poles, together with the 233 poles heretofore mentioned set by this company in the country, making the total 691 poles for the year. Of the increase of 94 poles within the city limits, this is accounted for by the necessary changes on account of building, which required the moving of wires and poles from these buildings, and erected 50 more poles where the wires were partly carried by the one pole which interfered with the building.

Q. I will ask you whether those 94 poles represent any actual extension of the plant of the company. A. They do not.

Q. The next item in this connection to which I wish to call your attention is that it appears by the report to which I have referred for work done in 1897, that there was an increase during the year of 621 miles of line wire. It appears, too, that no part of that 621 miles of wire was charged to construction. What is the explanation of that? A. Of that 621 miles of wire 100 miles of this wire was put by the American Telephone & Telegraph Co. for this company on the poles which I heretofore stated they erected. The balance of 521 miles of wire is put up principally in connection with running branch lines from the main line into the residences of the subscribers, quite a portion of it also being used in connection with lengthening the route of the wires in moving the poles out of the way of buildings, and improvements, etc. Also some of the wire was put up to replace old wire, that is, all of the old wire
657 not being taken down within the year 1897.

Q. Will you state whether any part of that 621 miles of wire represented any actual extension of the plant of the company? A. It did not represent any extension. We have made no extension of the plant in overhead wires in recent years.

Q. The next item in this report indicates that 26 new bridge fixtures were put up during the year, and it seems that none of them were charged to construction. What have you to say in regard to that? A. Of those 26 bridge fixtures, 13 were put by the American Telephone & Telegraph Co. for this company in getting wires across the Chain Bridge. The other 13 fixtures were fixtures put up across the Aqueduct Bridge by this company in replacing old fixtures put up eight or ten years ago that at that time were not carried on my yearly report.

Q. As to the poles, wire, and bridge fixtures erected as you have just stated by the American Telephone & Telegraph Co., what expense was incurred by the defendant company? A. Not a cent.

Q. The next item in this report refers to cable, and it appears by the report that there was considerable increase in cable during the year, and it seems that none of that was

charged to construction. What explanation have you to make in regard to that? A. The principal increase in cable
658 during that year was an item of 23,930 feet of 100-pair cable. Of that amount 15,506 feet were used in replacing the old asphalt system in the western and northern divisions, the cost of which was included in a statement previously made by me as to the cost of replacing the old asphalt conduits and cables, showing that the total expense of the new work was less than the cost of the work replaced. The other 8,424 feet of 100-pair cable was used partly in the eastern division and partly in the northern division in connection with finishing up the work of abandoning certain of the solid system cables, which work was paid for by the Metropolitan Railroad Co. on account of getting the cables lowered out of the way of this underground construction. This work was begun in 1896 and not completed until 1897. There are two small items of increase in 50-pair cable. This company has bought no 50-pair cable within recent years, but in connection with changing its branches it drew out 50-pair cable from one position and pulled it in another. In drawing out they credit maintenance and in pulling cable in they charge maintenance. Therefore, there is no credit or charge to construction in either case.

Q. It appears by the same report that there were 8,981 feet and 9 inches of trench, containing 51,907 feet and 4 inches of duct laid in 1897. It seems also that no part of this work was charged to construction. Will you state why? A. This is a part of the work charged to maintenance heretofore mentioned, on account of replacing the solid system of as-
659 phalt conduit and cables in the western and northern divisions.

Q. It appears also that in connection with the conduits we have just been speaking of there were 30 new B manholes constructed in 1897. Why was none of that charged to construction? A. They were also included in the same above-mentioned cost of replacing the solid system of asphalt conduits and cables. The solid system did not have or require any manholes.

Q. It also appears upon comparison of the reports for 1896 and 1897 that in 1896, on the 31st day of December, the total number of all underground conductor of all kinds owned by the company in the District of Columbia was 19,003.50, while on December 31st, 1897, the total number of feet of conductor of all kinds owned by the company in the District was 23,702,950. This shows an apparent increase in conductor feet of 4,699,900 feet. It appears also that no part of this increase was charged to construction. Will you explain that? A. This increase in conductor was contained in the 23,930 feet of 100-pair cable above mentioned.

Q. Upon comparison of these two reports for the years 1896 and 1897 it further appears that on the 31st day of December, 1896, the company had no aerial cables in the Washington division, while on December 31st, 1897, it is stated the company had 6,890 feet of 25-pair cable, 19-gauge aerial cable put in 1897. Why was this aerial cable not charged to con-
660 struction? A. This aerial cable was used in rebuilding the pole lines; instead of replacing the wire on the old poles with new aerial wires we put the cable up for economy, as we can string an aerial cable carrying 50 wires cheaper than we can put up 50 new overhead wires.

Q. Did that take the place of abandoned work? A. That took the place of abandoned work.

Q. Have you, at the request of counsel for the defendant, prepared a statement showing the approximate value on June 30th, 1898, of that part of the plant of the defendant company in the District of Columbia which is known as outside construction and which comes within your department? A. I have.

The witness produces the statement referred to, and it is offered in evidence by counsel for the defendant, and marked Exhibit "L."

Exhibit "L" in words and figures is as follows:

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EXHIBIT "L."

The Chesapeake and Potomac Telephone Company, Construction Department, June 30th, 1898.

Statement showing approximate value of outside construction in Washington, D. C.

89,160 ft. of 100 Pr., 19 gauge cable, at 50c		$44,580.00	
39,566 " " 50 " 19 " " , " 35c		13,848.10	
15,252 " " 50 " 18 " " , " 35c		5,333.20	
936 " " 25 " 19 " " , " 25c		234.00	
100 " " 10 " 19 " " , " 17c		17.00	
			$64,017.30
5,307 " " 20 " 19 " aerial cable, at 23c			1,365.61
Total value of cable			$65,582.91
76′ 6″ of 72 duct, at $10.64		503 64	
176′ 3″ " 64 " , " 8.26		1,579.20	
748′ 9″ " 56 " , " 7.84		5,870.00	
1,334′ 5″ " 40 " , " 5.60		8,592.73	
26′ 0″ " 36 " , " 5.04		131.04	
465′ 6″ " 32 " , " 4.48		2,003.44	
304′ 6″ " 25 " , " 3.50		1,065.75	
2,072′ 1″ " 24 " , " 3.36		6,968.20	
26′ 0″ " 20 " , " 3.00		78.00	
1,576′ 3″ " 18 " , " 2.70		4,235.88	
636′ 0″ " 17 " , " 2.60		1,653.60	
5,824′ 9″ " 16 " , " 2.56		14,911.36	
212′ 0″ " 13 " , " 2.08		440.86	
4,963′ 2″ " 12 " , " 1.92		9,529.28	
114′ 0″ " 9 " , " 1.40		159.60	
18,085′ 1½″ " 8 " , " 1.36		24,595.77	

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32′ 6″ " 7 " , " 1.19		98.17	
23,065′ 3″ " 6 " , " 1.02		23,526.55	
348′ 11″ " 4 " , " .80		279.13	
Carried forward		106,623.30	65,582.91
2,759′ 2″ " 2 " , at .61		1,683.09	
4,757′ 0″ " 1 " , " .59		1,855.23	
1,175′ 9″ " 2 " , in alleys, .61		717.21	
10,723′ 5″ " 1 " , " " , .39		4,182.13	
		115,060.96	
182 "B" manholes, at $130.00		23,660.00	
41 "A" manholes, at $200.00		8,200.00	
Total value of manholes and conduit			146,920.96
1,400 poles in city, set, at $19.70		27,580.00	
3,627 poles in county, set, at 4.64		16,199.93	
8 housetop fixtures, at 20.00		160.00	
26 bridge fixtures, at 10.00		260 00	
509.0 miles N. H. S. copper wire, aerial, at $26.79		13,636.11	
897.0 miles B. & S. copper wire, at $17.74		15,912.78	
1,457.3 miles iron wire, at $4 00		5,829.20	
Labor stringing 2,863.3 miles of wire at $5.00		14,316.50	
Cross arms, braces, pins, glass, brackets, etc., average $5.00 per pole (5,027 poles) at $5.00		25,135.00	
Total value of aerial plant			119,020.52
Grand total			331,524.39

663 Q. (Showing paper.) Who prepared this statement? A. I did.

Q. From what data or material? A. From my record of the physical plant of the company in connection with the outside work, the prices being obtained from the prices of material of the different classes averaged at the present time.

Q. Have you as to any of the items in this statement taken the actual cost of the work of the company? A. In some of it I have, but in very little of it.

Q. Why, in those instances, did you take the cost instead of the present value? A. Because the cost happened to be the present value.

Q. Can you tell us whether or not if the cost to the company of the items included in this had been taken instead of the value it would have increased or decreased the various amounts in the aggregate? A. It would have increased.

Q. Can you tell us in what proportion? A. I should say about 20 per cent.

Q. What, if anything, have you taken into consideration for the cost of superintendence or a proportion of the general expenses of the company? A. Nothing at all.

Q. What, if anything, have you taken into account in regard to a building or place in which the business of the company should be carried on? A. Nothing at all.

Q. Have you seen the lists which were filed here this evening in connection with the testimony of Mr. De Saules, being lists of the employes of the company at three different periods? A. I have.

Q. I wish you would state as to those lists as well as you can what proportion of the expense represented by them, as far as your department is concerned, relates to construction as distinguished from maintenance or operating expenses? A.

664 That list, as far as my department is concerned, is made on a basis of only maintenance.

Q. Do you know Mr. Haskins, who was examined here yesterday? A. Yes, sir.

Q. Did you have anything to do with the investigations he testified to having made as to the accounts of the company? A. Simply to furnish him what information he desired from my department.

Q. He has stated that at times he went to you for information, and among other things he had to rely upon you for information as to the amount paid for labor. Is that your recollection? A. Yes, sir; he relied upon me, together with my pay rolls. He had, of course, access to my pay rolls independent from myself.

Q. What have you to say as to the fullness and the correct-

ness of the information which you furnished him when he called upon you for information in the course of his examination? A. I furnished him everything he asked for.

Q. The question is, whether the information you gave him was full and accurate? A. It was.

Q. What access, if any, did he have to the books and papers in your department when he desired it? A. He had ac-
665 cess to any books and papers that he desired.

Q. Did he ever ask to see any accounts or papers or ask for any information when his request was not properly complied with? A. No, sir.

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Crenshaw, what was the capacity of conductor of the 9,045 feet of asphalt conduit abandoned? A. There is no capacity of conductor in the conduit. The capacity of conductor is in the cable.

Q. These asphalt conduits contained more than one cable, did it not? A. Yes, sir.

Q. What was the conductor capacity found in the cables in those conduits which were abandoned? A. 899,050 feet.

Q. What was the extent of the conductor laid in 1897? A. Do you wish to know the length of the conductor laid in replacing this or the total conductor laid?

Q. The total conductor laid. A. 5,249,300 feet.

Q. Was there any other conductor abandoned than you have just mentioned in your last preceding answer? A. There was other conductor abandoned in the latter part of 1896 that
666 was replaced by a portion of this conductor drawn in in 1897.

Q. How much? A. 3,881,850 feet of conductor.

Q. Was no part of the 3,881,850 feet of conductor abandoned in 1896 replaced in 1896? A. No, sir.

Q. A large amount of cable and conductor was drawn in in 1896, was there not? A. I do not remember just the amount. There was a very large amount drawn in.

Q. Didn't you draw in in 1896 35,574 feet of cable? A. Yes, sir; but we drew out also a large amount of cable that was not included in the above mentioned figures.

Q. How much? A. 19,915 feet were drawn out in 1896 independent of the above mentioned 35,574 feet.

Q. There was an increase of cable in 1896? A. Yes, sir.

Q. Of over 15,000 feet? A. Yes, sir, which was charged principally to construction.

Q. How much of it was charged to construction? A. As far as I know it was all; I have not the exact figures here now.

Q. There was an increase then in 1897 of several hundred thousand feet of conductor over and above all the aban-
667 doned conductor of 1896 and 1897, was there not? A. No, sir; I cannot state that there was.

Q. Was there not several hundred thousand feet more of conductor laid in 1897 than the amount of the abandoned conductor in 1896 and 1897? A. Jointly?

Q. Yes, jointly. A. No, sir.

Q. You have given me 899,050 feet of conductor abandoned in 1897, and 3,881,850 feet abandoned in 1896, making a total of 4,781,900 feet of conductor abandoned in those two years; you testified there was 5,249,300 feet of conductor laid in 1897. Was the difference charged to construction? A. That question is misleading. I did not make the statement that there was only 3,881,850 feet of conductor abandoned in 1896. I made the statement that there was that much abandoned in 1896 on account of being replaced with cable in 1897.

Q. Take it that way. Then the conductor laid in 1897 by way of replacement, as you put it, was several hundred thousand feet in excess of what you supposed to be replaced? A. Yes, sir, on account of it being cheaper to replace the cables in 1897 than the original cost of laying them.

Q. The capacity for service, then, was largely increased, was it not? A. I cannot say very largely, because it was not very largely increased.

668 Q. Was it not increased to the extent of several hundred thousand feet, I have indicated? A. It was.

Q. There was an increase in trench subway, was there not, of one and a half miles? A. No, sir.

Q. How much? A. There was a net decrease in trench subway in 1897.

Q. What was the trench subway in 1896? A. 80,072 feet and 5½ inches.

Q. Does not the report state the total trench subway on December 31st, 1896, to have been 71,027 feet and 5½ inches? A. It adds that in addition to that there was 9,045 feet of asphalt trench conduit, which is the trench conduit that was replaced in 1897.

Q. Were you accustomed to speak of the asphalt conduit as trench subway? A. Yes, sir.

Q. Is it carried on your books in that way? A. Yes, sir, it is carried as asphalt conduit.

Q. Is it called trench conduit? A. Yes, just as much as the other is.

Q. Is it called trench conduit in your reports? A. Of course. Asphalt trench conduit is the way it is expressed.

Q. Is it not distinguished from trench subway? A. Simply

because it is a different class of work, a different style of work.

669 Q. I ask you if it is not in the report distinguished from trench subway? A. No, sir; it is not distinguished from trench subway.

Q. What is meant, then, by the statements in the report, "Total trench subway on December 31st, 1896, of 71,027 feet 5½ inches?" A. It is simply a technical way of distinguishing one class of conduit from another class of conduit.

Q. How much of trench subway, giving it its technical signification, was there on December 31st, 1897? A. The technical meaning of subway is underground, and the entire asphalt trench and the drawing in system are both subways.

Q. You are still evasive.

Mr. WORTHINGTON: I object to that statement by the counsel on the ground that there is no foundation for it, and the witness is entirely correct and the counsel is entirely wrong.

Q. In your annual report is it not true that you distinguish between trench subway and the asphalt conduit? A. Simply as a technical distinction between the two pieces of work, so as not to get the two mixed up.

Q. Then maintaining that technical distinction, will you please tell me how much trench subway you had at the end of December, 1897? A. On December 31st, 1897, the company had 79,752 feet and 9½ inches.

670 Q. Did it then have any asphalt trench conduit? A. No, sir; the asphalt trench conduit was abandoned during the year 1897.

Q. What was the total duct feet of all underground systems at the end of 1896?

Mr. WORTHINGTON: You mean including or excluding the asphalt, the duct feet in the asphalt trench?

Mr. BIRNEY: It includes all that in my question. I said the underground system.

A. 659,325 feet and 6 inches of duct.

Q. At the end of 1897 you had 697,869 feet and 7 inches, did you not? A. We had.

Q. And no part of that difference has been charged to construction? A. No, sir.

Q. Do you know the cost of the 100-pair cables? A. Yes, sir.

Q. What do they cost? A. They vary.

Q. What causes the variation? A. The difference in the market value of the materials composing them.

Q. What is the present cost? A. I do not know as I can give the present cost. I can give you the last cost, about 45 cents per foot of cable.

Q. What is the last cost of the 50-pair cable, if that is the next size? A. The last cost of the 50-pair cable is, as near as I can remember, about 30 cents a foot.

671 Q. What is the last cost of the 25-pair cable? A. 23 cents a foot. I am referring to underground cable, of course. These prices are all f. o. b. cars Washington, and do not include hauling or handling.

Q. Do these poles which were put up by the American Telegraph & Telephone Co. become the property of the Chesapeake & Potomac Telephone Co.? A. Yes, sir, as far as I know. They were stamped with our name on them.

Q. Are they used by your company? A. Yes, sir; in some places they are.

Q. You say your company pays no part of the cost of putting them up? A. Not one cent.

Q. Whose labor puts them up? A. The labor paid for by the American Telephone & Telegraph Co., in this company's name.

Q. That was because that company had no legal right to put them up? A. Yes, sir.

By Mr. HEMPHILL:

Q. What proportion of the poles that you have up are occupied by service wires? I mean how many more wires can they hold than they do now hold? A. I suppose we could, on a pinch, get about three to five times the number on some of them. We would not like to do it, but we could do it.

672 Q. I mean in the regular course of business. Can you fix any estimate on that? A. I can only fix an estimate of what they are built to carry.

Q. How much are they built to carry? A. They are built to carry their present capacity. When we have occasion for more wire on the pole line it is customary to run a cable underground out to that pole line and open it at a point still farther out than the present cable terminates in connection with this line, thereby decreasing the overhead wires on the line by carrying them underground. The tendency is to diminish the size of the main pole lines always instead of increasing them.

Q. I understood you to say that you could put up a great many more wires on them than you have in this last answer. A. You understood me to say that I could do a thing that the lines were not built for the express purpose of doing.

Q. I ask you what could they reasonably carry in addition to what they are now carrying in the shape of service wires? A. Mr. Hemphill, that is a hard question to answer, intelligently, because by carrying aerial wires and cables we could probably carry a hundred times as many on the poles as we now carry.

You can get 50 wires into a space of about one and a half inches in diameter by using aerial cable.

Q. So that, as I understand you, many poles are now limited simply because you have upon them single wires. If
673 you put upon them cables you could carry a great many more service wires, as I understand? A. Of course we could.

Q. What is the difference in cost of a ten-wire pole, for instance, and a twenty-wire pole? A. A very slight difference. It depends upon the locations of the two poles. In some localities you can carry ten wires on a twenty-foot pole, and you can also carry twenty wires on a twenty-foot pole.

Q. Can you state what proportion of your subways are under sheet asphalt, what under block asphalt, and what under brick, &c.? A. I cannot give that except approximately. I have no measurements in my office showing the difference.

Q. What is the best statement you can make of it? A. About two-thirds is under sheet asphalt; of the remaining third a little over one-half is under belgian block, the remaining being under brick.

Q. In a statement of the value of the outside plant, as of June 30th, 1898, you made up your valuation according to the prices of those articles that composed this plant at that date, did you not? A. No, sir; that is made up on an estimate for what the plant could be duplicated for at the prices of the present date.

By Mr. WORTHINGTON:

Q. That is the plant as it stood on that date? A. As it stood on June 30th, 1898.

674 Q. That meant the plant duplicated as a new plant? A. Yes, sir, as a new plant. I could not duplicate it as an old plant.

By Mr. WORTHINGTON:

Q. Mr. Birney has elicited from you the statement that there was an increase of duct capacity of 1896 over 1897, and that no part of that increase was charged to construction. Why was that? A. Because the duct capacity was contained in the new conduits laid in replacing the old system of asphalt cables and conduits in the northern and western divisions, as I stated before, the cost of the new work being less than the cost of the work it replaced, and it was charged to maintenance.

A. P. CRENSHAW.

The further taking of these depositions was thereupon adjourned until Friday, December 8th, at 4 o'clock p. m.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

675 Washington, D. C., *December 9th*, 1898, 4 o'clock p. m.

Met pursuant to adjournment, at the office of the Chesapeake & Potomas Telephone Company, 14th and G streets, N. W., Washington, D. C.

Present on behalf of the complainants, Mr. BIRNEY.
Present on behalf of the defendant, Mr. WORTHINGTON and Mr. WILSON.

JOSEPH EDWIN CRANDALL, recalled on behalf of the defendant, was examined.

By Mr. WORTHINGTON:

Q. Mr. Crandall, when you were upon the stand before you were requested by counsel for the complainants to give them the cost price per station for a metallic circuit nearest in cost to a grounded circuit station. Are you now prepared to furnish that information? A. Yes, sir.

Q. Is it in the form of a statement? A. No, sir; the style nearest the grounded circuit style has been simply taken from the same data.

Q. Please state now in answer to this question what is the result of your investigation of the subject called for by the request referred to? A. The style corresponding nearest to the grounded circuit is our three-cell backboard style and including the entire expense of installing that station would
676 make it $26.16 per station.

Q. Is that the lowest price per station of any of the metallic circuits? A. Yes, sir.

Q. How do they range; what is the maximum? A. We have eight metallic circuit stations that run as high as $145.50 per station.

Q. Have you also at the request of counsel for the defendant prepared a statement showing the estimated cost of reproducing that part of the plant of the defendant company which is known as the inside work and which comes within your department? A. Yes, sir.

Q. Please produce that statement.

(The witness here produces a statement headed, "Cost of duplicating the Company's electrical plant, including switchboards, as of June 30th, 1898"). The same is offered in evidence by counsel for the defendant and marked Exhibit M.

Said statement is in words and figures following, *to wit:*

"Cost of duplicating the Company's electrical plant, including switchboards, as of June 30, 1898.

Cost of main switchboard, including distributing boards, power plant, cable, labor, etc.....	$34,052.27
Expense rearranging building for terminal room, and other changes to adapt building for switchboard and other equipment.....	3,611.15
677 Cost of department switchboards, including cost of switchboard, miscellaneous material and labor installing same.....	8,904.07
Cost of subscriber's station equipment (Metallic circuit), including bells, backboards, wall cabinets, desk cabinets, portable desk sets, protector, wire and labor.....	16,839.69
Cost of subscriber's station equipment (Grounded Circuit), including bells, backboards, desk sets, wire and labor.....	19,387.28
Cost of speaking tubes—private lines.....	4,061.17
And Extension Stations.....	1,784.75
Cost of installing public stations, including apparatus, booths, wire, miscellaneous and labor.....	7,835.02
Total	96,475.40

The WITNESS: May I make an explanation?

678 Q. Yes; go ahead. A. Every particle of the material that would be used in duplicating this plant, all of the time and all of the expenses incident thereto, are in that statement; while a great portion of the time and material and other incidentals that are charged to maintenance because of the existence of the plant as it is to-day also form part of the total amount there.

Q. What allowance, if any, have you made in that estimate for the cost of superintending the work of construction? A. Taking myself and my assistants, five in all, who are engaged in arranging plans, all of the testing, all of the superintending and all of the instrument setters and the entire expense of my force is included in the estimate there, as well as the material.

Q. What part of the fund, if any, for the general expenses of the Company have you included in that estimate? A. Not a cent.

Q. What allowance, if any, have you made for the cost of preparing plans for such an extensive work? A. Nothing.

Q. What allowance, if any, have you made for the cost of the

building in which the plant is to be located? A. That does not enter into the statement.

679 Q. In this estimate you have taken the prices of the materials and the cost of the labor at what period? A. The switchboard at the rate that we pay for the present board now in, in 1894; that particular sort of board has varied a little as to prices; it is known as the Branch Terminal Switchboard. The major portion of the subscriber's station equipment is based on the prices as I get them from the purchasing agent of this date, for the reason that we would buy the goods at this date at the prices prevailing now; I might mention that in many cases they are much less than they were during the progress of establishing the plant as it now stands.

Q. Can you give us any information as to how the aggregate of your estimate compares with the actual cost of the Company in putting in the present plant or that part of it which comes within your department? A. Well, my opinion is that it would be anywhere from twenty to forty per cent. lower than the actual cost to the company of its present plant.

Q. Do you know Mr. Haskins, who has testified here? A. Yes, sir.

Q. To what extent, if at all, did you aid him in the work of examining the books of accounts of the company as he has narrated? A. He asked me for very little information concerning the construction-equipment of the plant, but went

680 very fully into the question of maintenance of the plant, which I furnished him in detail.

Q. Can you tell me, in the first place, whether you exhibited to him any books or papers under your control that he wished to see? A. He did not ask to see my papers. He compared the statement that I made with the general books of the Company.

Q. Did he call upon you for information to aid him in his investigations? A. Yes, sir.

Q. Will you state whether you gave him the information he asked for and whether it was correct? A. Yes, sir; I gave it to him in detail and it was correct.

Q. What, if anything, did he ask you to furnish him in the course of his investigation which you did not furnish? A. Nothing.

Cross-examination.

By Mr. BIRNEY:

Q. How did you reach this sum of $34.052.27 as the cost of the main switchboard, including the additions mentioned here? A. From my own reports made at the time of the installation.

Q. What was the cost of the switchboard alone? A. With

its drops, answering jacks, etc., it was $20,000 and some odd; the cabling and the power plant and the intermediate
681 distributing boards where the wires connect were $8,000 and the labor of cabling the outside lines to the switchboard and the necessary cabling in the switchboard, something over $5,000, making an aggregate of $34,052.27.

Redirect examination.

By Mr. WORTHINGTON:

Q. Explain how it is that while the switchboard which was put in in 1894 with its appurtenances cost over $34,000 it appears from Exhibit G in this case that the amount charged to construction on account of equipment in 1894 was only $18-714.67? A. That was the difference between the cost of the new board and the depreciation of the old board, the "87" board, simply taking the difference between that amount and the $34,000, charging construction account only with the excess.

Q. That is, if I understand you, you took into consideration the value of the old switchboard when it was removed? A. Yes, sir.

Q. And after deducting that from the cost of the old switchboard then you deducted that from the cost of the whole and charged the difference to construction? A. Yes, sir; just made an increase in construction.

682 By Mr. BIRNEY:

Q. Did you deduct only the value of the old switchboard, or did you deduct the cost of the old switchboard? A. We deducted the value; that is, there was some small amount received for it, and then the difference was the depreciation of the old switchboard, which made up the total cost of the old switchboard.

Q. That is, the total cost of the old switchboard less the small amount you received for it was deducted from the cost of the board? A. Yes, sir, $34,000.

J. E. CRANDALL.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

JULIUS EDWARD DE SAULES, recalled for further examination on behalf of the defendant, testified as follows:

By Mr. WORTHINGTON:

Q. What rent does the defendant company pay for this building, or that part of it which it occupies for its general offices

and the Washington Exchange? A. $3,150 per annum.

Q. Are there any expenses which attend the occupation of the building except the payment of the rent? A. Yes, sir.

Q. What are they? A. We have to furnish the heat and light, furnish the engineer, the elevator boy, janitor, night foreman and watchman.

683 Q. What is the cost of keeping the engineer, the elevator boy, janitor, night foreman and watchman? A. That costs a little over $2,400 per annum.

Q. What does it cost to heat and light that part of the building which the company occupies? A. Between six and seven hundred dollars.

By Mr. BIRNEY:

Q. Does the company derive any revenue from sub-letting any part of the building? A. Yes, sir.

Q. How much? A. $1,380 per annum.

Q. That is all the income the company receives? A. Yes, sir.

J. E. DE SAULES.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

The further taking of depositions was adjourned to Saturday, December 10th, at 3.20 o'clock p. m.

684 WASHINGTON, D. C., December 10, 1898, 3.20 P. M.

Met pursuant to adjournment at the office of the Chesapeake & Potomac Telephone Company, corner 14th and G Streets, Washington, D. C.

Present on behalf of the complainants, Mr. Birney and Mr. Hemphill.

Present on behalf of the defendant, Mr. Worthington and Mr. Wilson.

ANNIE A. PROSPERI, called as a witness by and on behalf of the defendant, having first been duly sworn, testified as follows:

Direct examination.

By Mr. WORTHINGTON:

Q. Miss Prosperi, where do you reside? A. 403 10th St., southeast.

Q. How long have you lived in Washington? A. I have

lived here about 28 years.

Q. How are you employed at present? A. At present as clerk for the Telephone Company.

Q. Are you connected with the operating room of the exchange? A. Well, in a way I am. That is, for one year
685 I have been a clerk, but previous to that I had been in the operating room as assistant to the chief operator.

Q. How long were you employed in the operating room from that time? A. Since 1886. I came to the office in the fall of 1886.

Q. Did you then go into the operating room and take an operator's position on the switchboard? A. Yes, sir.

Q. You continued then to be in the operating room— A. In the operating room until I was made clerk.

Q. Were you an operator all the time during the interval? A. No, sir; in the last two years previous to being made clerk I was assistant to the chief operator.

Q. In performing your duties as assistant to the chief operator were you in the same room? A. Yes, sir; in the same room.

Q. I wish you would tell us, from your experience as an operator in this Exchange here in Washington, what has been your observation whether the use of telephones connected with the Exchange by each subscriber increased or decreased as the number of subscribers increased? A. The calls increased as the subscribers increased.

686 Q. Can you tell us in what proportion? A. Well, I can say that when I first came in the office we had about ten hundred and some subscribers, and we have nearly twice that now, or more, and the calls increased accordingly; that is, I would say they doubled.

Q. My question relates to whether the calls made by each subscriber increased—if that is what you mean—or do you mean the aggregate number? A. In the aggregate number and in each subscriber's calls—both.

Q. To what extent has the number of calls by each subscriber increased—has it doubled? A. I should say it had about doubled, yes, sir.

Q. How many subscribers can one operator take care of during the busy hours of the day, with the present number of subscribers? A. She can take care of one hundred subscribers.

Q. How many calls an hour does that impose upon her during the busy hours of the day? A. One hundred and twenty-five to one hundred and fifty calls; one hundred and fifty is about the maximum number of calls.

Q. To what extent does this number of one hundred and twenty-five and one hundred and fifty calls per hour reach the limit of the ability of an average operator? A. That

687 does not happen except in the busiest parts of the day.

Q. What I want to know is whether an operator can reasonably attend to any more than that. A. No, sir; not satisfactorily.

Q. What in your judgment would be the effect as to the number of subscribers one operator can take care of if the number of subscribers should be doubled now so as to make say forty-four hundred instead of twenty-two hundred as it is? A. You mean with the same operators and no more facilities than we have now?

Q. Yes. A. An operator could take care of just about half as many.

Q. Why is that? A. As the subscribers double she would have twice as much to do, and if she could only take care of one hundred otherwise she could only take care of fifty now.

Cross-examination

By Mr. BIRNEY:

Q. Have you ever made any investigation or kept any records to determine the proportionate increase of calls to the increase of subscribers? A. Yes, sir I have.

688 Q. Have you done so yourself? A. No; it has been kept in the office and I have in a way had to do it. I have never kept it for my own use.

Q. What have you had to do with it? A. As clerk I have had to keep at times a daily record of the calls in the office. We can see from that as subscribers increase why the calls increase; we have that to show for it.

Q. Can you give us any figures made by you at any time on this subject? A. I do not just remember in figures.

Q. What was the average number of calls per subscriber in 1886, when, as I understand, you came into the office? A. Average per subscriber?

Q. Average per subscriber, per day? A. I do not remember that.

Q. Do you know what is the average number of calls now per subscriber per day? A. The average number of calls per day is about ten calls. In 1886, when I first came in the office, I think it was then about four and a fraction calls.

Q. It has increased to ten now? A. Yes, sir.

Q. Have you ever worked upon any other board than the one in this exchange? A. No, sir.

689 Q. When you came into the Exchange as an operator how many subscribers did each operator care for? A. Each operator cared for about one hundred; it varied; on some boards there were more than on others. It averaged one hundred, sometimes more and sometimes less; I could not say about how many.

Q. You say that with the present apparatus the operator could not care for more than fifty, in your opinion? A. With the present apparatus?

Q. Yes. A. No, sir; she can care for every bit as many as with the other, but if the calls were doubled on her—that is what I said.

Q. Your statement was, as I recall it, that with the same apparatus now in use in the operating room the operator could not, if the number of subscribers were doubled, care for more than about one-half of the number now cared for by her. A. No, I did not say that. I said that with the same apparatus, if the number of subscribers was increased, unless the apparatus was increased accordingly, then she could not care for but half of them.

Q. If the apparatus were increased accordingly then what could she do? A. She could take care of the same
690 amount of calls she is taking care of now.

Q. Could she care for the same number of subscribers? A. Yes, sir.

Q. Do you know what was the number of subscribers when you came into the operating room? A. I think it was about eleven hundred all but eight or nine, about ten hundred and ninety.

Q. How many are there now? A. I think twenty-two hundred and some, nearly twenty-three hundred subscribers.

Redirect examination

By Mr. WORTHINGTON:

Q. Miss Prosperi, I do not quite understand the last answer you have given to Mr. Birney about an operator being able to care for the same number of subscribers as you can now if the apparatus were increased. What is the average number of calls that the average operator can take care of per hour? A. One hundred.

Q. And I understand that is about what she has to take care of with the present number of subscribers and the present apparatus? A. Yes, sir.

Q. But if the number of subscribers were doubled, then I understand you to say that the one hundred subscribers
691 whom she now cares for would make about two hundred or two hundred and twenty-five calls? A. Yes, sir.

Q. Could she take care of those? A. She could take care of only half of the number, only fifty.

Q. What did you mean when you said to Mr. Birney that even if the number of subscribers was doubled, that she could take care of the same number of subscribers if the apparatus

was increased? A. I meant to say it could not be doubled on each operator's section, it would require other sections to put these people on. I meant it could not be doubled on any one section.

Q. Did you mean anything different from what you said before, that she could only take care of fifty subscribers? A. No, sir; it was only the way he asked the question.

Recross-examination by Mr. Birney:

Q. This opinion of yours is based upon the theory, I take it, that the number of calls per subscriber were doubled with the doubling of the board? Am I right? A. Yes, sir; with the doubling of the board.

Q. That is, with the increase in the number of subscribers? A. Yes, sir; that is right.

692 Q. So you think that if there were ten calls per subscriber upon a board of two thousand drops, that upon a board of four thousand drops there would be twenty calls for each subscriber? A. Yes, sir.

Q. And on a board of six thousand drops how many calls would you expect from each subscriber, thirty? A. Three times as many, yes, sir.

Q. On a board of eight thousand drops, how many? A. Four times as many.

Q. You would expect forty calls per subscriber per day? A. Yes, sir.

Q. And on ten thousand you would expect fifty calls per subscriber per day? A. Well, it may be different; I do not say it would exactly be five times, but it would increase accordingly as the number of subscribers increased.

Q. Well, that would make fifty, would it not, on a board of that size? A. Yes, sir.

Q. Fifty calls per day for each subscriber? A. Not each subscriber, of course.

Q. Well, an average? A. Yes, sir.

693 Q. You have been taking the average, have you not? A. Yes, sir.

ANNIE A. PROSPERI.

Sworn and subscribed to before me this 4th day of June, 1899.

JOHN W. HULSE,
Examiner in Chancery.

MINNIE E. RICHARDSON, called as a witness by and on behalf of the defendant, having been first duly sworn, testified as follows:

Direct examination,

By Mr. WORTHINGTON:

Q. Where do you reside? A. 1127 G Street northeast.

Q. Where are you employed? A. I am employed at the Congressional Library as telephone operator.

Q. How long have you been there? A. Since January 1st, 1898.

Q. Where were you employed before that? A. I was employed with the Chesapeake & Potomac Telephone Company.

Q. In what way? A. I was employed as clerk for the company.

694 Q. Yes. A. And then my duties were assistant to the chief operator, and I worked at the long distance telephone and general utility clerk.

Q. For what period were you connected with the operating department? A. Since November, 1885.

Q. When you say you were employed as clerk, in what branch of the office were you employed? A. In the operating room.

Q. Were you clerk to Mr. Nevius, as the chief operator? A. Yes, sir.

Q. Where were the duties of the chief operator performed? A. In the operating room.

Q. From 1885 have you been familiar with the business of the switchboard and the operators there employed upon it? A. Yes, sir.

Q. Have you been an operator yourself? A. Yes, sir; I was employed until 1892 with the switchboard.

Q. From 1885 to 1892 you were one of the operators? A. Yes, sir.

Q. What has been your observation as to whether the number of calls per subscriber increases as the number of subscribers increases? A. I have found that they do; as the sub-

695 scribers increase the calls increase.

Q. How did you find that out? A. By practical experience, by working with them each day.

Q. Could you tell us from your own experience in about what proportion that follows? Say, if the number of subscribers doubles, at what rate does the calls per subscriber increase? A. The subscribers' calls would double.

Q. You were last in the operating room about a year ago, I believe? A. Yes, sir.

Q. At that time how many subscribers did each operator

have charge of? A. Each operator had charge of about one hundred subscribers.

Q. About how many calls per day, at the busiest time of the day, would that impose upon each operator? A. I think between one hundred and twenty-five and one hundred and fifty calls.

Q. How many calls per hour can an average operator take care of? A. Well, about one hundred and twenty-five calls per hour.

Q. Suppose, as the board stands now, and with the present subscribers—suppose that the number of calls of subscribers with the same number of subscribers should double
696 now, what would be the result as to the number of operators? A. The number of operators would be doubled.

Q. In that case how many subscribers could one operator take care of? A. Just about half as many, or fifty.

Q. In your judgment, if the number of subscribers should be doubled at this time, what would be the effect as to the number of subscribers one operator could take care of? A. Then the operator could only take care of about just one-half from the number she has now, or about fifty.

Q. Why would that be? A. As the subscribers increase the subscribers' calls increase. They have access to so many more people when the subscribers increase.

Cross-examination.

By Mr. BIRNEY:

Q. Have you ever kept any records along the line to which you have been testifying? A. Well, the records have been kept, and it was my duty as clerk to keep the records in the record book that was kept for that purpose.

Q. When did you last consult that record book? A. Well, I suppose the last entry I made in it was towards the end
697 of 1897.

Q. Have you ever consulted it for the purpose of determining the exact rate of increase of calls with the increase of subscribers? A. No, I have not. Of course when I was working on that work I naturally noted the increase, but I have never memorized any of the figures.

Q. What was there in your work to induce you to make comparisons in the different years in the number of calls? A. Well, it was to the advantage of the office to see how the work increased, to make arrangements for the service.

Q. When did you ever make an accurate comparison of the subscribers and calls in any two years? A. Well, I have never made the comparison myself; I have kept the figures.

Q. Are you able to give me now the figures in 1885, the date on which I think you said you went to the office? A. No, sir; I do not know the figures for that year.

Mr. WORTHINGTON: What figures do you refer to in your question?

Mr. BIRNEY: I refer to the number of subscribers and the number of calls per subscriber in that year.

698 The WITNESS: Well, the number of subscribers ranged to about ten hundred, but the number of calls the subscribers made at that time I do not know.

Q. In what year subsequent to that can you give me the number of calls per subscriber? A. I cannot tell you. I have a general idea of what the figures were, but I am not safe to say just what they were. I would not know just what year they were for.

Q. Then, of course, you are not able to say exactly in what proportion the increase was? A. Well, I know that the increase was according to the increase in subscribers; as the subscribers increase the work and the number of calls increase.

Q. That is the extent, then, to which you mean to be understood as testifying? A. Yes, sir.

Q. You cannot give us in figures the proportion of increase? A. No, sir; I cannot.

Q. Do you think that given two thousand subscribers on a board, and an average of ten calls per diem per subscriber, that with an increase in the subscription list of four thousand you would increase the average number of calls to twenty? A. I do.

699 Q. Do you think that with an increase in that board to six thousand you would increase the number of calls per subscriber to thirty? A. Yes, sir.

Q. And with an increase on that board to eight thousand subscribers you would increase the number of calls per subscriber to forty? A. Yes, sir.

Q. And with an increase to ten thousand subscribers you would increase the number of calls per subscriber to fifty? A. Yes, sir.

Redirect examination.

By Mr. WORTHINGTON:

Q. I would like to ask you whether the opinion you have expressed about the proportion which the number of calls per subscriber increases is based upon these reports which have passed through your hands altogether, or whether your experience as an operator has taught you anything on that subject? A. It is my experience as an operator.

Q. You stood at your place at the board and had so many subscribers to take care of? A. Yes, sir.

Q. And as the number of subscribers increased what did you ascertain as to the work you had to do for those subscribers?

700 Mr. BIRNEY: I object to that.

A. That they made more calls in proportion to the increase.

MINNIE A. RICHARDSON.

Sworn and subscribed to before me this 4th day of June, 1899. JOHN W. HULSE,
Examiner in Chancery.

GEORGE C. MAYNARD, a witness of lawful age, called by and on behalf of the defendant, being duly sworn, testified as follows:

Direct examination.

By Mr. WORTHINGTON:

Q. What is your age? A. 59.

Q. Where do you reside? A. At 1407 15th street, Washington, D. C.

Q. How long have you lived in Washington? A. More than thirty years.

Q. What is your business? A. Electrical engineer.

Q. How long have you been engaged in that branch of business? A. I have been engaged in the electrical business over forty years.

701 Q. Have you been at any time a writer on subjects connected with electricity, and particularly that branch of electrical matters which relates to telephony? A. Yes, sir.

Q. Are you the same George C. Maynard who appears to be a party to a number of contracts relating to the telephone business in the District of Columbia, which contracts are in evidence in this case? A. Yes, sir.

Q. Who started the first telephone exchange in Washington? A. I did.

Q. In what year? A. I started a sort of embryo exchange before there was any organization; I first commenced the construction of private telephone lines, and in order to familiarize the people with the telephone exchange system I used to connect them together in an informal way, and got them well going, and then in January, 1879, the regular exchange was established.

Q. Who had control of the business then in the telephone exchange you started? A. I had, individually.

Q. How long did you as individual remain in charge of the business? A. Until January, 1879.

702 Q. What change was then made? A. The National Telephone Exchange was organized, with myself and William H. Barnard as partners.

Q. That was a partnership, then, and not a corporation? A. Yes, sir.

Q. How long did you and Mr. Barnard, as partners, manage the business? A. Until December 1st, 1879.

Q. What change occurred then? A. Then an organization was formed called the National Capital Telephone Company, of which Mr. Gardiner G. Hubbard, Mr. Barnard and myself were the trustees.

Q. That was a corporation? A. Yes, sir.

Q. How long did that corporation have charge of the telephone business of the District? A. The two organizations I have referred to had only the exchange business. All the other business I retained personally until June 9th, 1881, when I sold out that portion to Mr. Cooke.

Q. The private line business, as the name indicates, I suppose, consisted of wires not connected with the exchange, but used by individual customers. A. Yes, sir.

703 Q. How long did that corporation have charge of the telephone business in the District? A. The National Capital Telephone Company?

Q. Yes. A. I cannot answer that from memory.

Q. State about when. A. My impression is it was 1883 that the Chesapeake & Potomac Telephone Company was organized, but I do not remember the date.

Q. It has owned the exchange business here, then, until the present company was organized? A. Yes, sir.

Q. After the partnership composed of yourself and Mr. Barnard was merged into a corporation, what connection did you have with the corporation besides being one of its trustees? A. I was general manager—the active manager of pretty much all the business.

Q. Were you a stockholder? A. Yes, sir.

Q. How long did you continue to be the general manager of the business? Down to the time it sold out to the present company? A. No; until 1881.

Q. And after that time what connection, if any, did you have with the business? A. I was a stockholder in the Chesapeake and Potomac Company.

704 Q. You have said that you were manager down to 1881. Do you mean you were manager down to the time the present company was organized? A. No, until 1881.

Q. The present company was organized in 1883? A. Yes.

Q. What connection did you have with the old company between 1881 and 1883 A. I was a stockholder.

Q. To what extent, from 1878, when the business was started here, until 1881, did you have opportunities to observe the operation of the Exchange, and particularly as to the number of calls per subscriber? A. I had the most perfect opportunity, and I took advantage of it.

Q. I wish you would tell us what was the result of your experience and observation during that time, as to how the number of calls per subscriber was affected by an increase in the number of subscribers. A. When we were making plans for organizing the exchange business we made most careful estimate based on all the information we could get from all available sources as to the cost of the business, and what would be a fair and profitable rate to charge subscribers, and we made estimate that we could operate an exchange with one hundred subscribers at a certain rate.

705 Q. What was that rate? A. The first agreement was that we should charge not over four dollars a month. Without attempting to make any scale of rates for future business we estimated that, as the number of subscribers increased, we could operate an exchange at a lower rate per subscriber, for example, at a lower rate for 200 than for one hundred; that five hundred would make a lower rate, and a thousand still lower, on the general idea that we could do a large business cheaper than we could a small business, but the clear and positive facts that soon developed in our experience upset all our theories and showed that we could not do it. We found that, as the exchange was enlarged, the increase in the amount of the service was about in proportion to the square of the number of subscribers in the normal condition of business—in abnormal conditions it very frequently exceeded this proportion. The general results were that the ratio was greater than that, and that the expenses per subscriber increased very largely with the increase in the service.

Q. What was done then, when experience taught you as to the rates which subscribers paid? A. Our first attempt was to do the business satisfactorily to the subscribers without regard to cost and then to get an increased rate which would be profitable, if we could bring that about. One feature of the business was this: In organizing and building the

706 exchange we had no limit as to the number of subscribers that we could put on one wire, and we calculated that we could run quite a number of subscribers (anywhere from two to ten or fifteen) on one wire; but in the experience gained in operating the exchange we very soon found that we were simply swamped with business, that one wire would not

do the work of so many subscribers, and in a great many cases we simply gave subscribers independent wires without saying anything about increased cost, and then gradually, as the business developed and we found out what would be a fair rate, we tried to get such a rate.

Q. What had the rate per subscriber per annum become in 1883? A. My active connection with the management of the company terminated before that. My recollection is that the highest rate charged while I was manager of the exchange was $75 a year. I may be mistaken, but that is my recollection.

Q. Why did you increase the rates from four dollars a month to seventy-five dollars a year? A. That we were compelled to do or go out of business.

Q. Why? A. We had no desire to do business at a loss and could make no profit at the rate originally fixed. We did lose money for a considerable time for the very reason I have given that where we contemplated giving a subscriber one-
707 fifth of the circuit we had to give him the whole of it.

Q. When your rates were increased from $48 to $75 a year what kind of a plant did you have here? A. Very crude and very cheap as compared with the present.

Q. How much underground plant did you have? A. Not any.

Q. How many poles did you have, approximately? A. Very few.

Q. How did you manage to reach your subscribers, then, in those days? A. By running wires over the house tops without any expense for the privilege.

Q. How many metallic circuits did you use in those days? A. Not any.

Q. What kind of wire did you use? A. No. 14 iron wire, the lightest that was made for that purpose.

Q. Was it what is known as grounded circuit? A. Yes, sir; nothing else was used.

Q. Mr. Maynard, in addition to your experience here in regard to this matter of the increase of business per subscriber, as subscribers increased have you made investigations
708 in other cities? A. Yes, sir.

Q. State in a general way the nature of those inquiries and the extent to which you have carried them on, and also the time covered by them. A. The subject has been one of great interest to me, and I have continually made a study of it in various ways. I have been frequently called upon to write articles in which that question was involved, for publication in electrical papers, and I have visited a great many exchanges in other cities prosecuting inquiries on that subject. I am not able to give the exact dates of such visits.

Q. What years did those inquiries in this way cover? A. Every year from that date to this.

Q. What is your judgment, then, based upon these inquiries and information obtained in this way, as well as upon your experience here, as to what rule governs the increase of business per subscriber as the number of subscribers increases? A. The facts that I have obtained confirm my experience here, and show positively that the increase of service exceeds the ratio that I have given.

Q. From your knowledge obtained by experience and by these investigations, what have you to say as to whether as the subscribers increase the cost of furnishing the
709 service to each subscriber increases or diminishes? A. It must increase.

Q. What is your opinion as to the value in 1883, when the Chesapeake & Potomac Telephone Company was organized, of the rights originally granted to you by the Bell Telephone Company, and which were vested in the Chesapeake & Potomac Telephone Company at or about the time of its organization, so far as those rights relate to the District of Columbia.

Mr. BIRNEY: Objected to as purely a matter of speculation on the part of the witness.

A. My opinion is that the cash value of the franchises covering the right to use telephones and other appliances in the District of Columbia, controlled by the C. & P. Tel. Co. at that time would be not less than five hundred thousand dollars.

Q. I wish you would state in a general way the elements which in your mind enter into that estimate. A. Everything covered by the various contracts; first, all the rights under the Bell patents with all extensions and improvements that might be made which the Bell Company was bound to defend; the rights to use all inventions which had been held by the Gold and Stock Telegraph Company, the American Speaking Telephone Company, the Harmonic Telegraph Company and some other rights which the Bell Telephone Company received under its contract with the Western Union Company,
710 which were transferred to me for use in the District of Columbia, and other advantages. The C. & P. Tel. Co. had at that time acquired all the private line interests which were originally excepted.

Q. Do you refer to the agreement between the National Bell Telephone Company and yourself, dated October 28th, 1879, when you speak of the patents controlled by the several companies which you have named? A. Yes.

The further taking of depositions was adjourned to 8.15 p. m. this day.

711 Washington, D. C., *December 10th*, 1898, 8.15 p. m.

Met pursuant to adjournment at the office of the Chesapeake & Potomac Telephone Company, 14th and G streets, N. W., Washington D. C.

Present on behalf of the complainants, Mr. BIRNEY and Mr. HEMPHILL.

Present on behalf of the defendant, Mr. WORTHINGTON and Mr. WILSON.

GEORGE C. MAYNARD, recalled for further direct examination, testified as follows:

By Mr. WORTHINGTON:

Q. Mr. Maynard, what, in your opinion, would be the effect upon the Chesapeake & Potomac Telephone Company now of doubling the number of its subscribers and at the same time of reducing about fifty per cent the average amount paid by each subscriber? A. It would speedily bankrupt the company.

Cross-examination.

By Mr. BIRNEY:

Q. What was the capacity of the exchange which you started in 1879? A. What do you mean by capacity?

712 Q. I mean its capacity for business. A. I do not understand your question.

Q. Did you have a switchboard? A. Yes, sir.

Q. What was the capacity of your switchboard? A. I could not tell you.

Q. Do you know how many subscribers it would accommodate? A. The switchboard was a very different affair from that now in use. It was so arranged that we could add a signal bell to each additional wire. When we got a new subscriber and needed a new wire we simply put one more bell and an extra key on a wooden frame provided for the purpose.

Q. And then you ran an independent wire from that magnet to the subscriber's place of residence? A. We ran a wire out from the office and connected a number of subscribers on that wire at first.

Q. Did you have any cables in your system? A. No, sir.

Q. And for each subscriber which was added you ran a new wire? A. No, sir .

Q. Explain how you did it. A. We had various ways of doing it. If we had a wire running off in a given direction with several subscribers on it, and we got one beyond the

713 outer terminus of that wire, we extended that wire to reach him. If the subscriber was somewhere on the

route of the wire in use we looped the wire into his office. In some cases we did run a separate wire to meet the extraordinary requirements of the increasing service.

By Mr. WORTHINGTON:

Q. What was the last part of your answer? A. I said after we got started we found it necessary to run some independent wires, and the necessity for the independent wires increased as the business developed.

Q. For how many subscribers did you plan your exchange? A. No definite number.

Q. You referred in your examination in chief to an exchange for one hundred subscribers. Did you mean by that your first plans were for the accommodation of one hundred subscribers only and that you did not look beyond that? A. No, sir.

Q. What did you mean? A. I meant to say in making our estimates of the cost of the business and the possible reasonable profits, we estimated that an exchange for a certain number of subscribers could be constructed for a certain sum, and the profit would be so much, and for different numbers of subscribers it would be different; that was the estimate on
714 paper.

Q. How many subscribers did you have at the end of the first year of your business? A. I do not know.

Q. About how many? A. I could not tell you.

Q. Can't you approximate? A. I could only guess at it; the figures were in the records of office.

Q. Have you the figures? A. No, sir.

Q. How many subscribers did you have in 1881? A. I do not know?

Q. When you ceased to be manager? A. I do not know how many.

Q. Did you at that time have a switchboard other than the kind you have mentioned? A. Yes.

Q. What was it? A. I cannot tell you just now the kind we had at that particular time, in 1881. There were various changes made during the time I was in charge of the business, but I cannot give the dates of those changes.

Q. What was the capacity for subscribers of the last switchboard you had, if it differed from the first? A. I do not know.

Q. Have you no recollection? A. Not distinctly.

715 Q. What is your best recollection? A. I will not attempt to say.

Q. Do you know how many subscribers there were at that time? A. No, sir.

Q. Why can't you say? Have you no recollection? A. I am perfectly willing to testify to anything I know, but I am here to tell what I know, not what I guess at.

Q. You have no recollection, then? A. That was a good many years ago and I do not remember those dates.

Q. And you do not even recall how large was your business when you ceased to be manager? A. No, sir. It was all a matter of record, and the records passed out of my hands.

Q. How many operators did you employ? A. I do not remember.

Q. What officers were employed? A. Very few. I was the General Manager and we had a Secretary and Treasurer for a time, and that was all the officers there were, except the Chief Operator. This small boy over here (indicating Mr. Nevius) was the first operator and he did all the operating for a while. Afterward he was the Chief Operator, and I think he superintended the work of two young women at first, and he did it very well.

716 Q. I have no doubt of it. Can you tell us how many operators he had under him at the time you ceased to be manager? A. No, sir.

Q. Have you no recollection on the subject? A. No, sir; the names of all the operators, the salaries they received and the days they worked were in the books. I suppose they are in the books still.

Q. Do you know what was the number of daily calls per subscriber at any time while you were manager? A. I do not remember.

Q. Did you keep any record? A. Yes, sir.

Q. Of the calls per subscriber? A. At times.

Q. And can you not now recall what that record showed? A. No, sir.

Q. Can you tell how great was the increase in your business? A. No, sir.

Q. (continuing) between the time of starting and the time your connection with it terminated? A. No, sir.

Q. How long did your first rate of not more than four dollars per month, as you have stated, continue? A. I do not

717 remember.

Q. What was your next rate? A. I cannot tell you that.

Q. Have you no recollection on the subject? A. No, sir; not enough to answer your question.

Q. Do you know what was your final rate? A. When I left the company?

Q. Yes. A. No, sir.

Q. What were the rates when you ceased to be manager? A. I do not know that. As near as I remember the highest rate that was established while I was with the company was seventy-five dollars—an advance from four dollars a month to seventy-five dollars a year.

Q. For what service did you charge $75, do you remember? A. Not distinctly. My impression is that $75 was charged for a single subscriber on a wire for a short distance, and for some considerable distance we charged the same rate with two or three subscribers on a wire.

Q. Can you give the proportion of single wires to the entire number? A. No, sir.

Q. Was the metallic circuit introduced before your connection with the company ceased? A. No, sir.

718 Q. Did you use the multiple switchboard? A. No, sir.

The WITNESS: There is one point that bears upon your question about the independent wires. I have said that those are always a matter of record, but I also stated that the avalanche of business that came down upon the company led us to give a single independent wire to some subscribers who had signed a contract to accept any kind of wire—a wire with any number of subscribers on it, and it is possible that the books will not show that fact. There were a good many independent wires operated just for that reason, not because the company was obliged to furnish them, but because in our endeavor to do the business satisfactorily we simply gave them the wire, while the contracts and receipts would show they were paying for a party wire.

Q. Did you retain any figures showing the number of calls per subscriber taken by you at any time in your experience? A. Do you mean, did I retain the papers personally?

Q. Yes. A. I don't know. It is possible I may have some memoranda. I will state further that I have always had a disinclination to destroy papers. Instead of destroying them I have been in the habit of putting them in a box and

719 storing them in a safe place. I have a number of boxes of that kind that I have not looked at for a long time. I may have some memoranda of that kind, but the official papers and books that pertained to the exchange went with the company.

Q. Have you seen any such memoranda since your connection with the company ceased? A. Yes, sir.

Q. How long ago? A. I should think about five years ago I had occasion to write a telephone sketch relating to the early business, for a paper that I was in the habit of writing for, and to get necessary data I did get a box out of the storage warehouse that had telephone papers in it. I think that was about five years ago, and I have not seen them since.

Q. Do you recall that they showed any figures? A. You mean about the calls?

Q. Yes. A. No, sir. I do not know as those papers had anything to do about the number of calls, because that was not the particular point of my sketch.

Q. How long has it been since you saw any of the memoranda made by you in the course of your experience as manager, concerning the number of calls made by subscribers? A. I think it is very doubtful whether I have seen any, and
720 if I have I certainly have not seen them in five or six years.

Q. Have you any recollection of having seen them since your connection with the company terminated? A. No, sir.

Q. Then you cannot say what was the number of calls in any year while you were manager? A. No, sir.

Q. Did your company make money, Mr. Maynard? A. Sometimes it did.

Q. Did it make much? A. I do not know what your association would call much.

Q. What do you mean by "my association?" A. I mean you—you attorneys.

Q. Is that the term which you usually apply to attorneys, or did you mean something else? A. I simply had in mind your telephone subscribers' association—perhaps I should not have said it that way.

Q. Perhaps not. A. It can be stricken out if you like, or I will ask to have it stricken out.

Q. No; let it stay. A. Very well; let it stay.

Q. Did you have capital stock in your company? A. One of the organizations that I referred to had capital stock.

721 Q. Which was that? A. The National Capital Telephone Company.

Q. What was the capital stock of that organization? A. My recollection is that it was two hundred thousand dollars.

Q. Was all that stock issued? A. I think so.

Q. And what dividend, if any, did you pay on that stock? A. I cannot remember that.

Q. Were any dividends paid? A. Yes, sir.

Q. Cannot you remember the rate of dividends? A. No, sir.

Q. Were dividends paid throughout the history of the company down to the time you left it? A. I think so.

Q. And you have no recollection of the rate? A. I think it was six per cent. That is my recollection, six per cent annually.

Q. On the par value of the stock? A. Yes, sir.

Q. Did you lay up any surplus? A. I do not know.

Q. You do not know or do you know—which did you say? A. I do not remember. I do not know.

722 Q. Have you no recollection on that subject? A. No, sir.

Q. Who held the stock? A. I could not tell you the names of the stockholders.

Q. Was it much scattered, or was it in the hands of a few persons? A. It was not held by a few persons. Quite a good many had it, but it was not exactly scattered.

Q. You yourself were a stockholder? A. Yes, sir.

Q. To what extent? A. I do not remember what I had originally. I sold stock from time to time, and I bought stock in the Chesapeake & Potomac Telephone Company. Without referring to accounts I could not answer those questions.

Q. At the organization of the National Capital Telephone Company how much stock did you receive? A. I do not remember.

Q. A considerable part? A. Well, that is rather a relative term.

Q. Well, that company succeeded a partnership consisting of you and Mr. Barnard? A. Yes, sir.

Q. Can you state how much stock was given you for your interest in that partnership? A. No, sir; I do not remember that.

Q. You were paid in stock, were you not? A. Yes, sir.

723 Q. What other exchanges have you inspected or investigated in order to determine the rate of increase of business from new subscribers? A. I might give you the names of a few of them. Baltimore, Philadelphia, New York, Springfield, New Haven, Hartford, Providence, Pittsburgh, Cincinnati, Indianapolis, Toledo, Cleveland, Detroit, Chicago, Binghamton.

Q. In what way have you obtained your information at those places? A. From consultation with the officers or men in charge of it, and from conversation with the operators and by visiting the operating room and observing the methods of doing business, and from inquiries of exchange subscribers and people who had been in the telephone business and were out of it.

Q. Have you ever received from those people exact statements of the increase in the number of calls with the increase in subscribers? A. I never made a practice of gathering statistics.

Q. Then you have not obtained statistics from those places on this subject? A. Not generally; no, sir.

Q. Then you are unable to give me the figures, for example, in the business at Boston? A. Not in exact figures. I have often seen statements, statistics and records in the offices which I did not find it necessary to get copies of or carry

724 away.

Q. When did you last see such figures? A. I could not tell you.

Q. Where did you last see them? A. I do not know where last.

Q. Can't you give us the year? A. No, sir.

Q. Or the city in which you saw such figures? A. I could not give you the year.

Q. Can't you state the person who showed you such figures? A. I could give the names of persons who have shown me statements or books or accounts in their offices, some of them, I can recall a few.

Q. Can you tell when that was done? A. No, sir; not exactly.

Q. Approximate it. A. The visits that I made at exchanges have been at different times and running over all these years since 1881, and I cannot carry dates in my head. I had no occasion to.

Q. Have you ever had any practical experience at any other exchanges than Washington? A. I never was employed in any other exchange to do the work.

Q. At what part of the system or the business of the telephone exchange do you find the increase in the cost resulting from an increase in subscribers? A. I do not quite un-

725 derstand the question. What part of the exchange?

Q. Yes, is it found in the operating room or where? What causes, in other words, the increase in cost out of proportion to the increase in subscribers? A. In construction and operation, both.

Q. Excluding the construction, where is it found? A. In the operation.

Q. What do you mean by operation? A. The operation of the exchange system.

Q. By that do you mean the wages of operators? A. I mean the number of operators and the wages, the central office operators, and a great many things that pertain to the operation of the system in the central office and out of it.

Q. What out of it? A. The care of the instruments in the subscribers' places, the superior kind of instruments and the care of them.

Q. Why should the instruments be superior with the mere increase of subscribers? A. For the same reason that you require a superior construction for a railway train that goes sixty miles an hour to one that goes five—for the greater use to which it is put it must be made better.

726 Q. Is that all you can say as to the increase outside of the exchange? A. That is one of the details.

Q. Is there anything else? A. Yes.

Q. What is it? A. You must have a much better plant and much better work to do that service. The old apparatus that we had first, that is, the old tap bells, are good enough for a small system, and the old bell that was used in the subscrib-

er's office would be very well for a small amount of service in the early times.

Q. Would it be regarded as sufficient now for a small service? A. It would answer for a small service now, in small exchanges where the service was never going to be increased.

Q. Is that old equipment used in small exchanges now? A. I do not think so.

Q. Has it gone entirely out of use everywhere? A. I think so.

Q. There has been a complete change, has there not, in the style of equipment? A. Many changes.

Q. And there has been an equally great change in the plant throughout? A. I think so.

727 Where do you find the increase in the exchange? A. I do not quite understand the question.

Q. Where do you find the disproportionate increase in cost over the number of new subscribers in the exchange? A. I could not answer that without giving a very long detailed account of the exchange. The cuts or the illustrations of the old exchange and an examination of the new one will show you more than I could describe to you in an hour.

Q. Do you find it anywhere but in the increased size of the switchboard to accommodate the greater number of subscribers and the increased number of operators upon that switchboard? A. Yes, sir.

Q. Where? A. I find it in this operating room.

Q. Where else do you find it but in this room? A. I find they have a lot of signaling motors, and a very extensive and expensive testing room, I suppose—they have in most places a testing department. It is all unnecessary with a very small exchange. They have superior skilled men, men every way superior.

Q. But you would have that testing room and the skilled men and the like in a plant of two thousand subscribers, would you not? A. I suppose you probably would, but this

728 old exchange that I am speaking about did not have any testing operator or any testing apparatus.

Q. The whole system of telephoning was then in its infancy, was it not? A. It was a pretty good working system for the amount of work it did.

Q. Was it not in its infancy so far as its use for commercial purposes was concerned? A. No, it was not in its infancy. It was a practical, every-day working thing, established on a commercial basis.

Q. What was the largest number of subscribers at any one exchange in the United States at that time? Do you know? A. No, sir.

Q. Can you approximate it? A. No, sir.

Q. If you would have the testing room and the skilled men in charge of the appliance for two thousand subscribers you would have the same men and the same appliances for four thousand, would you not? A. I do not think I would. I think it would require more appliances and more men.

Q. Would you need to double your testing room and its appliances? A. That would depend upon the conditions
729 of the exchanges, which might vary a good deal.

Q. Would you, as an electrician, expect to find that the case? A. In some exchanges; in others I should not.

Q. Would you in a well equipped exchange of two thousand subscribers expect to find a doubling of the testing room if the number of subscribers was increased to four thousand? A. I would in some. I think it depends largely upon the conditions of the exchange.

Q. In what kind of a plant would you expect such a doubling in that department? A. I think an exchange with a great many overhead wires and submarine wires, and a good many cables, would probably have to double the capacity of that department.

Q. Would you expect to find it where there was no submarine wires and where a large number of the cables were underground? A. I could not say that it would not be necessary.

Q. What else would you expect to find increased by these various scientific appliances which you have mentioned? A. In order to answer that question I should have to go through the whole exchange and describe to you a whole lot of
730 apparatus of different sorts—and those are different in different places.

Q. Would you expect to find any of that apparatus doubled? A. Yes, sir.

Q. What apparatus? A. There are a great many devices about the exchange, about the plant, that I think would be doubled.

Q. What would they be? A. I have given you the principal ones.

Q. What are they? A. I have told you.

Q. I want you to tell me again. A. The testing department is one of them.

Q. What else? A. Signaling apparatus. I do not mean to say that they would simply double just what they have, but they would require much better facilities, which would in many cases be governed by a different kind of apparatus, requiring the abandonment of the old; that is what has happened in exchanges continually, that they would have to throw away the old apparatus and buy newer and better.

Q. That is, get an apparatus fit for four thousand instead of two thousand? A. Yes, sir.

731 Q. You do not mean that they would double the extent of the machines? A. I think in some cases they would and in some cases they would not.

Q. What machines would be doubled? A. I have told you. There is this important element that comes in: An exchange does not double its number of subscribers off-hand in one day or in a month; during the year or two that the exchange has increased from one to two thousand the whole business is being improved and developed, and they may get so much superior central office apparatus, and when the one or two or five years and during which the number of subscribers has doubled they are obliged to throw away the old apparatus and buy an entirely new outfit for the whole of the exchange plant, or a portion of it, or they may have to add more things to it.

Q. Although in the meantime they have kept up the plant as you have indicated you would expect them to throw away at the end of the increase the old apparatus? A. I say that it has happened sometimes, and I think it is liable to happen.

Q. When did you know it to happen and where? A. I think all the exchanges in the country have had two or three sets of central office apparatus since the business was started.

732 Q. Has that not been due to the improvements which have been made in the inventions? A. It has been due to the necessity of having new inventions that have been brought out. I do not think they would try to get inventions simply because they are new.

Q. It has not been due altogether to the fact that the former machines were inadequate, but because new inventions were more efficient? A. I think it is due to both reasons. If a new machine is very much more efficient than the old one then the old one is inadequate to do the service the people can require. The people generally require the best they can get.

Q. Did you first receive the right to use the inventions owned by the American Bell Telephone Company by the contract of 1879 already alluded to? A. There was no American Bell Telephone Company in existence at that time.

Q. With whom did you deal at that time? A. Gardiner G. Hubbard.

Q. He was the trustee for the Bell patents? A. Yes, sir; the first contract was made with him.

Q. That was when you first obtained the right to use the Bell patents? A. Yes, sir.

733 Q. How much did you pay for those rights? A. Nothing. The contract shows all the conditions.

Q. At that time your partnership was the National Telephone Exchange? A. No, sir; there was no partnership. It was formed later.

Q. Were you dealing then individually? A. Yes, sir.

Q. When did you form your partnership with Mr. Barnard? A. January 21st, 1879.

Q. Did you have any new contract with Mr. Hubbard then or with the Bell Telephone Company? A. I made a second contract December 2nd, 1878, with the Bell Telephone Company.

Q. What was the date of your first contract? A. April 22nd, 1878.

Q. When you made your second contract did you pay anything to that company? A. I paid no money.

Q. Did you and Mr. Barnard pay anything to the American Bell Telephone Company? A. No, sir.

Q. When was the American Bell Telephone Company organized? A. I do not remember. I could not tell you that; I
734 do not know when the company was organized. I did know all that; I had all that on record. I could not give you the date of the partnership without looking at the papers; I did that this afternoon for the first time in a good many years.

Q. From the time you first entered upon this business in 1878 down to your leaving it in 1881, had you or your associates paid anything to the Bell Telephone Company for the right to use its inventions, except what may have been paid according to the terms of the contract already alluded to? A. No, sir; except we of course paid royalties and a certain percentage.

Q. What territory did you have, Mr. Maynard? A. The original contract covered the District of Columbia and a radius of ten miles from the Capital and the Government business in the Fifth Lighthouse District. That is as I remember it. It is in the contract here. Subsequently this business in the Fifth Lighthouse District was relinquished, being in consideration of their giving us the right to use all the telephone inventions that had been under the control of the Western Union Telegraph Company.

Q. When was that, do you know? A. That contract was made October 28th, 1879.

Q. That is the one you referred to in your examination in chief? A. That is the third contract.

735 Redirect examination.

By Mr. WORTHINGTON:

Q. Mr. Maynard how much of the stock of the Chesapeake & Potomac Telephone Company do you hold now? A. None at all.

Q. How long has it been since you ceased to be a stock-

holder in the company? A. Quite a good many years, six or eight I should think.

Q. Have you any interest in the company at all now? A. I bought stock and paid one hundred dollars in money for it, and I sold it out for almost anything, down to seventy-five cents. No, sir, I haven't the slightest interest in the company, except that the company has not treated me very well and I have a kind of grudge against them.

Q. How did it happen that you looked up your contracts and papers today in reference to this matter? A. I had an impression that some questions might be asked as to the dates of certain contracts, which I could not at all remember, and I had in mind to come up to this office to see this report of the Congressional Investigation which gave the dates of the contracts. On the way I stopped at a building where my safe is stored to look for some other papers, and there found a bundle of the original contracts. I put them in my pocket, carried them home and looked them over for about ten
736 minutes.

Q. When were you first informed that you would be examined as a witness in this case? A. Last Saturday.

Q. By whom? A. By Mr. Worthington.

Q. Had anybody connected with the case spoken to you before or made inquiries? A. No, sir.

Q. Or had counsel on the other side communicated with you about it? A. Not as a witness.

Q. Well, in any way? A. I met these two gentlemen here (indicating Mr. Birney and Mr. Hemphill), and asked them for some information about the general telephone situation in Washington for the purpose of writing an article for my paper, and they both asked me a good many questions as to my knowledge of the telephone business, and for information especially on this subject of increase of business out of proportion to the increase of subscribers.

Q. What did you tell them?

Mr. BIRNEY: I object to that as incompetent.

A. Practically what I have said here, nothing but the truth, and I had no reason for withholding anything from them. I told them both they never could maintain the position they were contending for, that the business did not increase out of proportion to the subscribers.

737 Q. How long ago was that? A. I should think it has been a month.

Q. How do you explain the fact that in 1878 or thereabouts you acquired these rights in this territory and paid nothing for them—these rights under the contracts in evidence—while you estimate that those rights in 1883 were worth half a million

dollars? A. In the first place I had known and been rather intimately associated with Mr. Hubbard a good while before the telephone business came on, and I became very well acquainted with Professor Bell and was associated with him in some experiments, and when the time came for selecting an agent Mr. Hubbard offered me the agency. At that time while there were a few people who had confidence in the practicability of the telephone and the success of the telephone business generally, most people did not believe in it at all, but declared it a humbug, and after I had the contract in my hand I could not give it away. I offered a man in Washington half of it for nothing if he would simply come in and give his advice, but he would not do it, and I have letters from some of the best business men in Washington saying that the thing never would be of any practical use, and advising me to go out of it. At the same time I believed there was something in it and other people have found it out since then. At that time
738 Mr. Hubbard desired to get the business started and as the undertaking required much preliminary work, he gave me the contract for nothing, while a few months later they began to make short contracts and required a certain percentage of the stock as payment for the license.

Q. When these contracts were made with you originally, to what extent had the telephone exchange business been developed in this country or anywhere else? A. It had only been suggested to my knoweldge in one instance, and that was in a letter that Professor Bell wrote from England, in which he said that his hopes for the telephone business were increasing, that it might seem very chimerical, but he believed the time would come when a man would have a telephone in his house, which would enable him to talk to his neighbor, his physician and to his drug store in the neighborhood, and perhaps a wire to another group of subscribers in another part of the city, and everybody laughed at it. That is all there was in the exchange business when I made the first contract, and the first practical suggestion of an exchange in this city was when I had a wire of my own from my office on G street to the Capital Building, another to the "Star" Office, and three or four other
739 places; and I made an attempt to delude the "Star" reporters into the idea that if anything important occurred in Congress before the "Star" went to press they might get the news through the telephone, and I kept Mr. Nevius sitting by the telephone while Congress was in session for the whole winter to meet that emergency. They soon got into the habit of using the telephone and found it indispensable. The enterprising "Evening Star" would not believe there was anything in it at all until they could not help it.

Q. You have told Mr. Birney that first the partnership and then the corporation owned this business in the District of Columbia and paid dividends or profits. Will you please tell us whether or not you were required to increase the rates as the number of subscribers increased, so as to enable you to keep on making a profit?

Mr. BIRNEY: Objected to as being clearly matter for examination in chief, and as leading.

A. I can answer that in this way. We started the business with this rate of four dollars a month, but did not make any money at that. We found we were rapidly using up what capital we had, and that we would have to increase the rates. We kept along as best we could, as near as I can remember, from six months to a year, when we began to charge a higher rate.

740 I do not remember what that was. I have an impression it was $60. That information was in the books, but I do not carry the items in the books in my head. As we went on still further and fairly understood the way we were going and what the necessities of getting higher rates to meet the extra demands from increased service were, we brought the rate up to $75, and as the first contracts expired we advanced the prices to the original subscribers. We did not make any profits at all for quite a while.

Q. You have stated in answer to Mr. Birney's question that in the exchanges generally in this country there has been required occasionally a complete change in the apparatus in use in the central offices on account of improvements. Are those improvements still going on or not? A. Yes, sir; continually.

Q. From your knowledge of the business what do you say as to the probability that the same expense will be imposed upon exchanges in the future of making complete changes in their central office apparatus to keep up with the march of improvement. A. If the fair possibilities of the increase in the telephone business are realized, I do not believe the best of the present apparatus will last a great while.

Q. Have you had any actual experience with the multiple switchboard? A. I never operated it.

Q. It was not in use in this District while you were general manager? A. No, sir.

741 Q. You have spoken of Mr. Hubbard, trustee, as controlling the Bell telephone patent. Were there any other telephone patents? A. There were soon after that. I think Bell's patent was the first telephone patent issued.

Q. What were the others called? Whose patents were they? A. The most important ones were Edison's and Gray's. Those I think were the two. There were a great many incidental inventions of value which the Bell Telephone Company acquired.

Q. Acquired how and when? A. By purchase, from time to time. The business had not been started before Mr. Hubbard was besieged by crowds of inventors. Ninety-nine per cent. of them were probably some worthless things, but occasionally there would be a good one. Berliner's was one of the things that developed here and was bought by the Bell telephone interests.

Q. Did the Bell telephone company acquire the Edison or the Gray patent? A. They did through the contract with the Western Union Company.

Q. Did you or did the organization with which you were connected here through the Bell Telephone Company acquire the right to use those patents? A. Yes, sir.

Q. What contract covered that? A. The third contract covered all that.

742 Q. At that time do you know whether or not there was litigation going on involving the question of priority of these telephone inventions? A. Yes, sir.

Q. And they settled it and gave all the rights to the company here? A. Yes, sir; and it stopped the competition here.

Q. Where is Mr. Barnard, who was once your partner? A. The last I heard of him he was in California.

Q. How long has he been in California? A. I think since about 1881. He did not remain with the business very long.

Recross-examination.

By Mr. BIRNEY:

Q. How much capital did you put into the business, Mr. Maynard? A. I do not remember. I used up all the money I had and all I could get hold of.

Q. You do not know how much that was? A. No, sir.

Q. Do you know how much Mr. Barnard put into it? A. No, sir.

Q. How much did your firm put into it? A. I do not know.

Q. How much did the stockholders of the National Capital Telephone Company put in, do you know? A. No, sir.

743 Q. You have spoken of having had conversations with Mr. Birney and Mr. Hemphill. Did you go voluntarily to the office? A. Yes, sir.

Q. Without having been sent for? A. Yes, sir. It was simply as a newspaper correspondent, as I stated to them at the outset. I got a little useful information and gave a good deal more of some sort to them. The gentlemen seemed more anxious to interview me than I was to interview them. I took great pleasure in telling them anything I could.

GEO. C. MAYNARD.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

WILLIAM D. SARGENT, called as a witness by and on behalf of the defendant, being first duly sworn, testified as follows:

By Mr. WORTHINGTON:

Q. What is your age? A. 53.

Q. Where do you live? A. In Brooklyn.

Q. What is your business? A. My business is that of an electrical engineer.

Q. Are you connected with the telephone business at all? A. Yes, sir.

Q. In what way? A. I am the vice president and
744 general manager of the New York and New Jersey Telephone Company.

Q. How long have you held that position? A. I have been connected with the company since 1882. I think I was made general manager in 1884 or 1885, and elected vice president in either 1885 or 1886.

Q. What territory does your company operate in? A. It operates in Staten Island and Long Island and practically the northern half of New Jersey.

Q. And I presume it operates a number of telephone exchanges in that region? A. Yes, sir; all the principal towns.

Q. What are your largest exchanges? A. The largest exchanges are Brooklyn—

Q. And as you state, give the number of subscribers about in each. A. Brooklyn about 8,500. Newark, 2,800. Jersey City and Hokoben, about 2,300. Patterson, about 1,200. We have exchanges in Eliazbeth and Morristown, and New Brunswick, Freehold, Long Branch and Asbury Park and Plainfield.

Q. How long have these principal exchanges been in existence? Give the dates as near as you can of the principal ones. A. The largest of the exchanges were opened in 1880.

Q. And were they opened with about their present number of subscribers or have they increased gradually to the present number? A. They opened with a very small number of subscribers and they have increased during all this time.

745 Q. What system of rate fixing is in force in your exchanges now? Have you more than one system? A. We divide the subscribers into two classes, the first and second. The first class embraces the larger cities of Brooklyn, Newark, Jersey City and Hoboken. The second class embraces the other towns that I have mentioned. The rates are sched-

uled for the cities of the first class and also for the cities in the next class.

Q. Do you in general charge flat rates so much per year for a subscriber or do you have some other way of arriving at the proper charge? A. We charge principally on the basis of messages.

Q. Just explain that plainly. A. We have two classes of service on direct wires and on party wires, and the number of messages is 500. That increases in a diminishing scale per message up to the amount of use the subscriber needs.

Q. You mean a subscriber pays so much and has the right to 500 messages during the year and if he uses any more he pays a certain prescribed rate per message? A. Yes, sir

Q. No man would have the right to use a certain larger number of messages during the year without extra charge. A. He makes a contract according to the number of messages.

Q. What proportion of your subscribers in Brooklyn, for instance, have this measured service? A. I think about
746 80 per cent. and that is the average throughout the territory.

Q. How long has that system of measured service been in vogue in your territory A. It was under consideration in 1893 and 1894, and I think was adopted and put in force in 1895, although I would not be sure that we did not make some contracts in 1894.

Q. Prior to that time what did you charge? A. Prior to that time we charged so-called flat rates.

Q. So much per year with unlimited service? A. Yes, sir.

Q. Why did you change? A. We changed because the use with unlimited service in the larger cities was growing to such an extent that it was becoming unprofitable, and we especially wanted to reach a broader stratum of business by lower rates, and the plan that was adopted permitted us to do that. The results have I think quite justified the means. That is, we have increased much more rapidly under the limited or message rate service than we ever did before.

Q. What do you mean by saying that your business had increased so that it became unprofitable?

Mr. BIRNEY: That is objected to on the ground that it is not what the witness said.

A. Well, in the larger cities the use grew to such an extent that I think both in Newark and New Jersey and also in Brooklyn we had a number of subscribers that were costing us a great deal more than they paid us, and that num-
747 ber was increasing all the time.

Q. Why did they cost you more than they paid you? Why was it that some subscribers cost you more than they

paid you? A. We had subscribers paying the flat rates that did not use the telephone 500 times a year, and we had other subscribers that used it 15,000 times a year.

Q. Both paid the same rate? A. And many of them paying the same rate; yes, sir. There was a difference in the flat rate in favor of the residences always.

Q. That was because residences as a rule, I presume, use telephones less than business houses? A. That was a rough method of measured service.

Q. From your experience what can you tell us as to whether the service per subscriber increases or decreases as the number of subscribers increases? A. Under the original plan of flat rates the number of calls per subscriber was increasing all the time, and I think an examination that I made a few years ago shows that in a term of about eight years the rate per subscriber had more than doubled—the number of calls per subscriber had more than doubled.

Q. As the business has developed what has been your experience as to whether the cost of the plant required per subscriber has increased? A. That has steadily increased. The multiplication of wires was constantly exhausting or
748 using up the facilities that we had, so that in putting up poles instead of their lasting during the time they should last, we were compelled to put in new poles to carry more wires before they were used up, and in the larger places we very soon had, in addition to the capacity that a pole would carry in single wires to put up cables, and the next step was underground conduits and cables. Each one of these steps involved a very great increase in cost per mile of wire.

Q. Well, on the whole, what has your experience taught you as to whether in order to make a reasonable profit the rates which subscribers paid should increase or decrease as the number of subscribers increases, where the flat rate is in vogue? A. I do not know that I understand the question.

Q. That is, where you charge a reasonable profit, subscribers paying $50 a year, whether with the number of subscribers doubled you can reduce your rate or must increase it to obtain the same reasonable profit? A. At any fixed rate the increasing number of subscribers would involve an increasing cost and in order to make any profit at all, an increasing rate must be charged.

Q. If the system were conducted entirely upon the measured service plan how would that be? A. The measured service plan, properly applied, I think takes care of the problem completely.

Q. What do you mean by saying it takes care of the
749 problem? A. It provides for a payment commensurate with the amount of service rendered.

Q. What effect, if any, has introducing the measured service system upon the number of calls per subscriber? A. The effect of the measured service is to reduce the usage by the subscriber, in most cases.

Q. Why? A. Well, I suppose that it is fixed in his mind that every time he uses there is a certain charge, five cents more or less. I really do not know what the operation of the subscriber's mind may be in regard to it. I only know the fact.

Q. Have you made this a subject of investigation in the cities? I mean in cities outside of your own territory, or has your knowledge upon this subject been confined to what you have learned by experience in attending to your own business? A. My knowledge is confined principally to the territory in which I operate, and that is so large and diversified a territory that I think it involves about all the problems that can arise, but I do not know of the same conditions in other places through conference with the various officers and in visiting other places.

Q. I was about to ask you, whether so far as you know there is anything in the local situation where you carry on your business which would indicate that the results would be any different in other places? A. I do not think so.

750 Q. Have you in mind any particular subscriber whose name you could mention and the number of calls has increased out of proportion to the number of the increase in subscribers, as an illustration of what you mean? A. Yes; I recollect that, because it was brought to my particular attention, and that is the firm of Abraham & Strauss. That is the largest dry goods house in Brooklyn. Their use, I think I found from the last examination I made, was more than 15,000 a year.

Q. What had it grown from to that amount? A. That would be hard to tell. The firm has changed, but I presume that that growth was developed in say about eight years. Their use as a beginning was probably 1,500 per annum.

Q. I would like to have your judgment as to whether it is possible to carry on the telephone business under any fixed permanent system which provides for furnishing unlimited service for a limited price? A. I do not believe it would be practicable at all.

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Sargent, has the firm of Abraham & Strauss just mentioned by you increased in business notably in the last eight years? A. Yes, sir.

Q. To what extent would you say their business had increased? A. That I don't know. The extent of the buildings they occupy I should say was from four to five times as
751 as great as it was six or eight years ago.

Q. They have more than one telephone, have they not? A. Yes, sir.

Q. How many? A. They have either eight or ten wires connected with the central office now.

Q. They pay of course for eight or ten telephones? A. Within the last two years they have put in a private branch exchange system, which we are introducing in the large cities, to customers of their class.

Q. How many telephones had they at the time eight years ago when you say they had 1,500 calls? A. They began with one, and at the time they made the contract for the private branch exchange I think they had either three or five. I think it was five. They were inadequate for the business and we were getting constant complaints from customers that they could not reach them.

Q. Is your company a licensee of the American Bell Telephone Company? A. No, sir.

Q. What position does it occupy in respect to that company? A. We hold a license from the New York Telephone Company.

Q. Then the New York Telephone Company is a licensee of the American Bell Telephone Company? A. I believe
752 so.

Q. And it has been subletting to you a part of its territory, I suppose? A. Yes, sir.

Q. Who fixes the rate in your territory, Mr. Sargent? A. The board of directors.

Q. And do your contracts with the New York Telephone Company give that company the right to fix the rates? A. That is my understanding.

Q. That is, the New York company reserved to itself the right to fix your rates? A. No; I mean that we fix the rates.

Q. Have you examined on that point the contracts made by your company with the New York Telephone Company? A. Not recently.

753 Q. Are you sure that you are right when you say that you are not controlled in the matter of rates by the New York Telephone Company? A. We never have been controlled. I would not say that there is not anything in the license, but we have never been controlled. As a matter of fact the rates have been made by the officers of the company and approved by the Board of Directors.

Q. Are the officers of your company also officers of the New York Telephone Company? A. No, sir.

Q. Are your directors, any of them, members of the Board

of Directors of the New York Telephone Company? A. I think three of them are directors in the New York Telephone Company.

Q. How many are there in all? A. How many directors?

Q. Yes. A. There are twelve.

Q. Do you pay royalties to the New York Telephone Company? A. Yes, sir.

Q. On what? A. On the telephones.

Q. And on the switchboard? A. We pay a royalty to the Western Electric Company on the switchboard.

Q. But on the transmitters and receivers, you pay a
754 royalty to the New York Telephone Company? A. Yes, sir; to the New York Telephone Company.

Q. How many subscribers have you in Brooklyn? A. In Long Island we have about 9,600, and I think there are about 8,500 in Brooklyn.

Q. Have you more than one exchange in that territory? A. Yes, sir; we have twelve.

Q. Are they connected? A. They are all connected with each other by trunk lines.

Q. What is the largest exchange? A. The largest exchange is what we call the Brooklyn office. That is located near the City Hall.

Q. That has how many? A. I should say that has in the neighborhood of 3,000 subscribers.

Q. You have said that you have in Brooklyn about 80 per cent. of your subscribers on measured service? A. Yes, sir.

Q. Leaving 20 per cent. on flat service contracts? A. Yes, sir.

Q. Have you taken the average number of calls per subscriber for the 20 per cent. on a flat service? A. We make systematic records, but I don't recall the figures now, except that the last figures showed that the 20 per cent. we were doing—I think it was pretty nearly 60 per cent. of the number of calls.

Q. Do you remember the average number of calls per subscriber? A. No, I do not. The general average num-
755 ber of calls per subscriber I think is about 6.

Q. Have you separated the two classes in determining the number of calls per subscriber? A. I have not done that recently, no, sir.

Q. How recently have you done it? A. I have not seen any statements of that kind I think for about a year.

Q. Do you recall the number of calls per subscriber at that time, when you last saw the statement? A. It is about six.

Q. I am speaking now of the flat service rate subscribers. A. I cannot separate them, no, sir.

Q. You cannot recall the number per subscriber? A. As near as I can recall, I think the average amongst the unlimited

subscribers, the flat rate, was 11 or 12, and the message rate was from three to four.

Q. When was the Brooklyn Exchange opened? A. I think originally in 1880. It was before my connection with the company.

Q. You have been connected with it since about 1885? A. 1882.

Q. You have been general manager since 1884 or 1885, I think you said? A. Yes, sir; I was General Superintendent in 1882.

Q. Do you recall the number of subscribers with which the Brooklyn office opened? A. Not when it opened, be-
756 cause I did not know anything about it then.

Q. How was it in 1884 when you became General Manager? A. In 1882 there were about 500.

Q. I am asking you about 1884, when you were General Manager. A. That I could not tell you without reference to tables.

Q. Do you know the percentage of flat rate subscribers in Newark? A. It is probably not more than 10 per cent.

Q. Can you give us the number of calls per subscriber in Newark? A. No, I don't recall the figures. The use at Newark, however, is more active than it is in Brooklyn.

Q. To what do you attribute that? A. To the fact that Newark is further away from New York, and is more of an independent city than Brooklyn is. Brooklyn has no great commercial center of its own.

Q. What is the percentage of residence telephones in Brooklyn? A. As near as I can recollect—I am now recalling the figures made up for the year 1897—there were between 1,000 and 1,200 residences, and that would be out of 7,000 to 7,500.

Q. I think you gave the number a short time ago as about 8,500 in Brooklyn. Does that represent the increase
757 over 1897? A. Approximately.

Q. But you had about 7,500 at the end of 1897? A. Yes, sir.

Q. When the change was made from the flat rates generally to the measured rates, was that done because the business was growing unprofitable, or because it was found that the measured service rates would be more profitable? A. I think the prime reason for doing it was to reach a class of subscribers that we could not reach with flat rates.

Q. That is to say residences and small dealers, who could not afford to pay the flat rates charged? A. Yes, sir.

Q. Have you made more money under the measured service rates than you did under the flat rates? A. No, sir.

Q. Have you made less? A. I hardly feel certain on the subject. I think we have made less; that it has been a transi-

tional period, you know since 1894 and 1895, and I do not consider the figures are conclusive, but the indications are that the profits are not so large, necessarily, because we are not getting the former average rate.

Q. When was the measured rate system first introduced in the country in the telephone business? A. I suppose the first instance was in San Francisco along about 1880. I do not know whether that antedates Buffalo. Buffalo, I think,
758 put it in in 1881, or perhaps in 1882, but it may have been introduced in Buffalo in 1880.

Q. Did you use it at all before 1894? A. Only in the way of pay stations.

Q. By pay stations, you mean where any casual user of a telephone might pay for the message? A. Yes, sir.

Q. What period of 8 years did you allude to when you referred, in answer to Mr. Worthington's question, to an increase in the number of calls? A. From 1887 to 1895.

Q. During that time what was the increase in your business? A. I could not tell you.

Q. What was the increase in the number of your subscribers? A. I could not tell you. The increase in 1897 was 3,760.

Q. Does that mean over your whole territory? A. Yes, sir.

Q. In answer to Mr. Worthington, you spoke of this period of 8 years and said that the rate of calls had notably increased in that period. Did you mean by that over your whole territory or in any one of the places you have mentioned? A. Not any more anywhere else than in the city of Brooklyn, but principally in the larger cities.

Q. Can you give us the number of subscribers you had
759 in Brooklyn at either end of that period of 8 years? A. No, sir.

Q. Can't you tell how many you had in 1885? A. Not without reference to the figures. I did not charge my mind with it.

Q. When did you look at the figures? A. Well, I do not often look back six or seven years. The figures of 1897 and 1898 I have, because those I have in my mind. I am studying them all the time, but back of that I do not recollect. There is such a mass of detail thatI really cannot charge my mind with it.

Q. When did you make a comparison between the figures of 1897 and 1895, if any? A. My recollection is I made it in 1894 and 1895, and also in 1896 and 1897.

Q. And yet you now cannot give us the figures? A. Not from memory, no, sir.

Q. You have not here the means of refreshing your memory, I suppose? A. No, sir; I have not.

Q. And you cannot now tell what number of subscribers you had in 1887, in Brooklyn? A. No, sir; I could not.

Q. Or what was the rate of calls per subscriber? A. No.

Q. What was the increase in the number of subscribers in 1897? A. 3,760.

760 Q. Do you recall what was the increase in 1896? A. About 1,800.

Q. And that was due to the use of measured service, you think, very largely? A. That and our pay stations.

Q. Then you accomplished the object you had in mind when you adopted the measured service system in reaching a larger number of people? A. Yes, sir.

Q. How many operators do you have at work at one time in the main Brooklyn exchange? A. I could not tell you.

Q. In Brooklyn how many subscribers does each operator care for? A. From 65 to 100.

Q. How is the number regulated? A. According to the amount of service, according to the number of calls the subscriber makes.

Q. That is, the operator would have a fewer number who had business telephones exclusively or almost altogether than one who had largely residence telephones? A. Yes, sir. The newer subscribers usually use the telephone less. The older subscribers use it more freely, and their use is increasing all the time.

Q. That you find to be so, do you not, even without an increase in the number of subscribers? A. Yes, sir.

Q. As the subscriber becomes more familiar with the
761 use of the telephone he uses it more frequently? A. That is my observation; yes, sir.

Q. To what extent would you say that increase goes, say in a period of five years? A. I could not answer that question precisely.

Q. It would be considerable, would it not? A. Yes, sir; there is a very considerable increase every year.

Q. Due to that greater familiarity with the instrument and its use? A. Yes; the use of the telephone is growing very rapidly in our territory throughout.

Q. I mean by particular subscribers, a man becomes more familiar— A. I am speaking of the old subscribers, the original subscribers. They are using it more and more frequently, and as the number of subscribers increase they have more opportunity to use it.

Q. You say that the cost of the plant per subscriber has increased. Won't you explain what you mean by that? What part of the plant has increased in cost? A. Every part of it.

Q. Specify more particularly. A. Well, we began with iron wire at three or four cents a pound, then we began to use copper. The price of copper wire ranges from 13 to 24 cents a pound.

Q. Is the life of the copper wire greater than the life
762 of the iron wire? A. I believe it is.

Q. How much greater? A. Well, I don't know. It depends on the conditions largely.

Q. Can you average it? A. I don't know the life of a copper wire really. The iron wire with us, depending on the location, lasts from five to ten years.

Q. A copper wire, you understand, will last much longer? A. Copper wire will last much longer. We have had some cases where it has decayed within four or five years, in a place where it was affected apparently by chemical substances in the air.

Q. What other part of the plant has increased? A. The mileage of wire is doubled by the metallic circuit. The cost of poles is doubled by the increase in the number of wires. Cabling is more expensive, and underground conduits still more expensive, so that in every step that we have made there has been an increasing cost per mile of wire up to the present underground system.

Q. Do you operate the underground system? A. Between 60 and 70 per cent of our wires in Brooklyn are underground. They are largely underground in most of the large cities, in Jersey City, Hoboken, Newark, Paterson and Passaic, Orange, East Orange, Summit, Morristown, Plainfield, Montclair, New Brunswick.

Q. For what number of subscribers was the Brooklyn
763 plant built? A. I think the plans and the offices that we have opened would probably provide for between twelve and fifteen thousand.

Q. Was that so at the first? A. No, sir.

Q. My question refers to the institution of the plant. A. No plans were made then.

Q. Then no provision was made for future extension? A. We were making provision all the time. What I mean is that no comprehensive study was made at that time.

Q. That was the capacity of the exchange when you opened it? A. I could not answer that, because I cannot answer as to the number of subscribers. If you refer to the Brooklyn office when we put in the new switchboard, we planned it for 1,800 stations.

Q. When was that? A. That was installed in either 1888 or 1889.

Q. Have you changed that since? A. We are just now preparing to abandon it and move into a new building. I have just made a contract for an entirely new switchboard to be placed in the new building.

Q. Then the largest switchboard that you have in your

twelve offices in Brooklyn is one containing 1,800 drops? A. It contains more than that now, because we have about 2,800, nearly 3,000 stations there, so that we have been adding
764 to it ever since. It was planned for 3,600 stations, but it was equipped for 1,800.

Q. Is your underground system in Brooklyn separated in any way from the territory covered by the overhead system? A. I do not quite understand the question. Physically, of course, it is separated by the space between the wires on the poles and the wires on the conduits.

Q. I presume that in the outlying districts you would use the overhead system? A. Yes, sir; in the outlying district and thinly populated districts we still have poles.

Q. What proportion of the whole is underground in Brooklyn? A. I think I said 70 per cent.

Q. Has your underground system a capacity for more subscribers than you have upon it at present? A. Yes, sir.

Q. To what extent? A. I do not think we are using more than 50 per cent of our underground conduits.

Q. Do you regard it as an advantage or a disadvantage to have more subscribers on that underground system? A. It would depend on whether we could serve them with profit or not.

Q. Under your present system I mean? A. Under our present system we are increasing at the rate of about 4,000 a year.

765 Q. You are desirous of increasing, are you not, Mr. Sargent? A. Yes, sir.

Redirect examination.

By Mr. WORTHINGTON:

Q. Mr. Sargent, if you were required to furnish to subscribers at one-half the existing rate and take all that came, how would you feel about additional subscribers being a disadvantage to you? A. We could not serve them at one-half the present rate without a serious loss.

Q. In the answers you have made to Mr. Birney, what do you understand by the words "under our present system?" A. The system of charging for the amount of service rendered.

Dec. 21st, 1898. W. D. SARGENT.

The further taking of these depositions was adjourned to Tuesday, the 13th instant, at 2:30.

Subscribed and sworn to before me, this 21st day of December, 1898.

JOHN W. HULSE,
Examiner in Chancery.

766 WASHINGTON, D. C., Dec. 13th, 1898, 3:20 o'clock p. m.

Met pursuant to adjournment at the office of the President of the Chesapeake & Potomac Telephone Company, Fourteenth and G streets northwest, Washington, D. C.

Present on behalf of the complainants, Mr. Birney and Mr. Hemphill.

Present on behalf of the defendant, Mr. Worthington and Mr. Wilson.

VINCENT A. HUBBARD, called as a witness by and on behalf of the defendant, being duly sworn, testified as follows:

By Mr. WORTHINGTON:

Q. Give your full name. A. Vincent A. Hubbard.

Q. What is your age? A. Forty-two.

Q. What is your residence? A. Washington, D. C.

Q. Your occupation? A. I am secretary to the president and general manager of the Chesapeake & Potomac Telephone Company, and in that connection have charge of the contract department.

767 Q. How long have you held that position? A. I was appointed secretary to the president and general manager of the company on October 24th, 1895.

Q. How long have you had charge of the contract branch of the business? A. Since the first of July, 1898.

Q. Whose business is it to take charge of contracts with subscribers and be familiar with the history of each individual contract? A. That belongs to my department, sir.

Q. Are you also familiar with the pleadings and the handling of suits against the company? A. Yes, sir.

Q. In regard to which this testimony is being taken? A. Yes, sir.

Q. Are there any other cases, and if so what, in which suits are pending, in which the contract of the plaintiff has never been terminated as provided by the terms of the contract? A. There are. I have a list of them here. There are 26.

The witness produces the list referred to, and it is offered in evidence by the counsel for defendant, and marked Exhibit N, and is in the words and figures following, to wit:

List of injunction suits in which contracts were not terminated by ten days notice in writing as required by said contracts.

768 No. 19,795 Danenhower and Company,
" 19,820 Vinson and Perry,
" 19,819 Lafferty, E. B.
" 19,879 Denison, F. A. and Company,
" 19,887 Hospital, Frank D.
" 19,886 Mt. Vernon Steamboat Company.
" 19,888 Weedon, J. C. and Company,
" 19,885 Bentley, E. J.
" 19,880 Holmes Brothers,
" 19,881 Collins and Gaddis,
" 19,893 Taylor and Paine,
" 19,895 Brooke, W. I. and Company,
" 19,898 Wheeler, B. L.
" 19,896 Stohlman, Frederick,
" 19,897 Walters and Company,
" 19,900 Harvey and Gaylor,
" 19,894 Offutt, Henry W.
" 19,904 Duparquet, Huot and Moneuse Company,
" 19,953 Elsworth M. Simpson,
" 19,950 Ada S. Reed,
" 19,952 Dyer, J. E. & Co.
" 19,934 Tharp, James
" 19,999 Taylor, A. S.
" 19,966 Tyssowski Bros.
" 19,965 Kelly and Chamberlin,
" 19,973 1st Co-operative Building Association.

By Mr. WORTHINGTON:

769 Q. Mr. Hubbard, it has appeared in evidence in this case that there are different kinds of service afforded to exchange subscribers and different kinds of equipment. Are you able to state, from your knowledge of the contracts, what are those various classes of cases and what are the rates in each? A. Yes, sir.

Q. In the cases enumerated on this list is the contract, so far as it refers to how it should be terminated, in the same phraseology? A. Yes, sir; I am sure it is, in every case.

Q. What is that phraseology? A. (Reading.) "And furnish service for one year from the first day of , 1898, and thereafter until this agreement is terminated by ten days' notice in writing, given by either party to the other upon the terms and conditions stated below and on the back thereof."

Q. In the cases included in the list, Exhibit N, has any such notice been given by either party, either verbally or in writing?

A. It has not, with the exception that in some of those cases a notification was sent to the subscriber in arrears, that if payment was not made before a certain time the service would be discontinued.

Q. As a matter of fact, has any such service been discontinued? A. No, sir.

Q. The company has not exercised its right in that
770 regard? A. No, sir.

Q. Are there any of the pending cases in which the contracts were in force, and suit was brought up to the present time, where they were for measured service as distinguished from the flat rate? A. No, sir.

Q. What are those cases? A. I think there are six of those cases.

Q. Please give us the names of the subscribers. A. W. S. Barker, W. H. Coleman, A. Eberley's Sons, E. B. Lafferty, G. W. Merrill & Company, Tyssowski Brothers.

Q. Please read from one of these contracts the part which refers to the rate which the subscriber is to pay? A. (Reading from contract with W. S. Barker.) "And agree to pay for the right to send in said year 600 local measures, $66, payable quarterly in advance, for additional local messages, 9 cents each, payable as herein provided."

Q. Will you state whether or not the other five contracts which you have just enumerated are in substance the same, so far as the provision relating to what the subscriber is to pay is concerned? A. Exactly the same, except as to the amount, which differs with the number of messages subscribed for.

Q. It appears in evidence that the defendant company furnishes several different classes of service to its subscrib-
771 ers, and that for the different classes there are different kinds of equipment. Are you able to state from your knowledge of the contracts of the company what those several classes of service and equipment are? A. Yes, sir.

Q. And the rates charged in each case? A. Yes, sir.

Q. Please do so. A. The standard annual rates for exchange metallic circuit service with the ordinary long distance wall equipment in Washington were as follows:

For business houses, one party on a line, $125; two parties on a line, $100 each; three parties on a line, $90 each.

For residence service, $100 for one party on a line; and two parties on a line, $80 each; three parties on a line, $70 each.

For grounded circuit exchange service the rates are:

For business, one party on a line, $100; two parties on a line, $80 each; three parties on a line, $60 each.

The same service for residence purposes:

One party on a line, $72; two parties on a line, $60 each; three parties on a line, $40 each. Both of these services are unlimited.

For measured service—all measured service is metallic circuit—the rates are, for the ordinary wall equipment:

No. of call	Special line.	Two-party line.	Three-party line.	Extra calls.
600	$66	$54	$45	8c each
700	73	61	52	7c each
772 800	79	67	58	6c each
900	84	72	63	5c each
1,000	88	76	67	5c each
1,200	94	82	73	5c each
1,400	100	88	79	5c each
1,600	106	94	85	5c each
1,800	112	100	91	5c each
2,000	118	106	97	5c each
3,000	148	106	97	5c each

The WITNESS: In addition to the rates that I have just given there are charges for excess mileage which in the case of the unlimited metallic circuit service for subscribers beyond one mile of exchange is for one party on a line, $10 a quarter of a mile or a fraction thereof, and for two parties on a line $6 per mile or a fraction thereof. For the excess mileage on grounded circuit service, $25 a mile, or $6.25 a quarter of a mile or a fraction thereof.

The mileage charges on measured service are as follows:

One party on a circuit, each a quarter of a mile beyond one mile of the exchange, per annum, $9.

Two parties on a circuit, each a quarter of a mile beyond one mile of the exchange, each party per annum, $6.

Three parties on a circuit, each a quarter of a mile beyond one mile of the exchange, each party, per annum, $4.50.

In addition to the ordinary equipment which is included in the rates I have given, the company furnishes what we term
773 an American Telephone and Telegraph wall cabinet, and an annual charge of $5, in addition to the regular rate, and with the Chesapeake & Potomac wall cabinet on contracts amounting to less than $100 per annum $5.00 per annum in addition to the standard rate.

We also furnish a desk set at $10 per annum in addition to the standard rate; auxiliary bells at $6 each per annum; extension stations on grounded or metallic circuit lines for flat rate service, to be called only at $30 per annum; on the same service to call and be called, $36 per annum, extra; on the same

service, to call and be called, with private line service, $50 per annum extra; and in connection with the measured service extension stations are furnished at $12 per annum extra, plus the cost of installation, in the last case only.

The company also furnishes a Gray automatic blue bell on measured service contract at $5 per annum extra, or the Gray automatic wall cabinet in connection with measured service at $10 per annum extra.

Q. Counsel for the complainant have asked for information as to the number of free telephones or telephones for which regular rates are not charged and paid. Are you able to give us the facts as to that matter? A. Yes, sir.

Q. Please do so. A. There are in use for company purposes in Washington the following telephones:

In connection with the President's office	7
In connection with the Treasurer's office	2
774 The Secretary's office	2
Auditor's office	2
Directors of the company	3
Construction Department	6
Electrical Department	7
Operating Department	2
In the wareroom	3

And there are also furnished in connection with the company's business in Washington—that is, in the Western Union Office, &c., and the Postal Telegraph Office—seven sets of instruments, making a total of 41 sets. Beside these, there are twenty deadhead telephones.

VINCENT A. HUBBARD.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

775 BURNET L. NEVIUS, JR., recalled for further examination, testified as follows:

By Mr. WORTHINGTON:

Q. Mr. Nevius, have you, at the request of counsel for the defendant in this case, prepared a statement showing the names of the subscribers to the defendant company, who use the telephone largely in excess of the average rate per subscriber? A. Yes, sir.

Q. Is this the list (indicating paper)? A. Yes, sir.

Q. On what days were the accuonts kept, the result of which is embodied in that paper? A. October 27th, October 21st and November 1st.

Q. Just state what the paper contains? A. The paper contains the names of the subscribers whose calls are shown here and the number of calls on each of the days mentioned, and then in addition to that the average number of daily calls arrived at, averaging those three days; also computing from that the annual number of calls, estimating the number of business days to be 300 in the year.

Q. That is supposing that the use of the telephone during the other days of the year would be about the same? A. Yes, sir.

The paper above referred to by the witness is produced and offered in evidence by counsel for the defendant, and
776 marked Exhibit "O."

Q. Will you state whether any of the persons whose names are on this list had more than one telephone in use at the time the account was made? A. I think there are five names there of persons who have two telephones.

Q. State who they are? A. John H. McGruder has two telephones, one receiving telephone and one sending telephone. Knox Express have two telephones, one receiving and one sending telephone. W. B. Moses & Son have two telephones, one receiving and one sending telephone. The Pennsylvania Freight Depot have two telephones, one receiving and one sending telephone. The Baltimore and Ohio freight also have two telephones, used for both purposes of receiving and sending.

Q. Do you say in all the other cases mentioned on the list that the calls came from one telephone? A. Yes, sir.

Cross-examination.

By Mr. BIRNEY:

Q. Take the case of W. B. Moses & Sons, were the calls opposite their name in the list all made from one telephone? A. Yes, sir. The other telephone is a receiving telephone, and they have no facilities for sending calls over that.

Q. Does the number of calls there indicated include the incoming calls, or is it confined only to calls made by that
777 particular subscriber? A. It is confined to calls made by that station.

Q. Calls by that station? A. Sent over that station.

Redirect examination.

By Mr. WORTHINGTON:

Q. You did not keep any record, however, of any calls that these same subscribers answered during these same days? A. I have no record of that kind.

Q. Why is it that some of these heavy users of telephones have one telephone for making calls and one for receiving calls?

A. That is because of the inability to take care of the whole service from one telephone.

Q. Can you give me any illustration of this? A. Notably in the case of Knox Express Company and the Boston House. I think I can get you a record of those things. I think one house had in the neighborhood of fifty such calls.

Q. In one day? A. During the day we took the record, that was some time ago. It was taken because there were frequent reports of their line being in use, and complaints were made by certain subscribers. The same thing applied to the Baltimore and Ohio and the Baltimore and Potomac before they put in a second telephone.

778 Q. You have said something about the case of the Knox Company being a notable instance. What do you say as to the calls made upon them that they could not answer before they got in two telephones? A. I say that my recollection is that the number of times that the line was found to be busy in the course of the day was in excess of a hundred.

BURNET L. NEVIUS, JR.

Counsel for the defendant offer in evidence a table taken from the report of the Interstate Commerce Commission for the year ending June 30th, 1896, being a summary as to the railroads of the United States, the proportion of earnings, &c., assignable to passenger and freight service, and the percentage of operating expenses and operating income by groups.

Mr. BIRNEY: That is objected to as irrelevant and immaterial.

The report in question is filed herewith and marked Exhibit "Q."

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

779 SAMUEL M. BRYAN, recalled for further examination, testified as follows:

By Mr. WORTHINGTON:

Q. You have heard the testimony of Mr. Nevius. I would ask you whether there is any difference in the rates charged for a telephone which is used only for receiving calls? A. The rate for receiving telephones is $50 per annum, and that is always a metallic circuit telephone, and in the case of where it is used in conjunction with a grounded circuit it is 15 per cent of the regular grounded circuit rate, and where used in connection with a metallic circuit telephone it is forty per cent of the metallic circuit rate.

SAMUEL M. BRYAN.

Subscribed and sworn to before me, this 11th day of January, 1899.

JOHN W. HULSE,
Examiner in Chancery.

780 WASHINGTON, D. C., Dec. 17, 1898, 3:30 o'clock p. m.

Met pursuant to adjournment at the office of the Chesapeake and Potomac Telephone Co., Washington, D. C.

Present on behalf of the complainants, Mr. Birney.
Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

JOHN A. TOMPKINS, a witness of lawful age, called by and on behalf of the defendant, being first duly sworn, and is examined.

By Mr. WORTHINGTON:

Q. What is your full name? A. John A. Tompkins.
Q. What is your age? A. 61.
Q. Where do you reside? A. Baltimore, Md.
Q. How long have you resided there? A. 32 years.
Q. What is your business? A. The management of trust estates, financier and public accountant.
Q. What experience have you had as a public accountant? A. The investigation of railroad accounts, steam and street, manufacturing corporations, gas corporations, telephone
781 companies, banks and trust companies.
Q. At whose instance have you made these examinations? A. For the State of Maryland, the United States Circuit Court, the chancery courts of Maryland, for stockholders, for creditors, and for underwriting syndicates.
Q. In a general way, what have your investigations called upon you to do? A. To make a critical examination of the accounts of corporations, of their financial condition, or their earnings and expenses, of the correctness of their accounts, and such an examination in general as would be called upon in a case in court or for the satisfaction of underwriting syndicates in making investments.
Q. To what extent did these investigations require you to become familiar with the method of keeping books in use by such corporations as those into whose affairs you have inquired? A. It required a critical examination of all books of account and of all vouchers for disbursements and everything connected with the financial operations of these corporations.
Q. How far back does your experience of this kind go? A. 25 years.
Q. Were you called upon at any time to investigate the finan-

cial affairs of the Chesapeake & Potomac Telephone Co., the defendant here? A. I was called upon by the Telephone
782 Commission of the State of Maryland, in 1895, to make an examination of the affairs of this corporation under the act of the General Assembly of Maryland of 1894. I was called upon by this corporation itself to make an audit of its accounts for the year 1897. I was further called upon by this corporation to make an audit, an examination of its accounts in the early part of this year, in connection with the bill then pending in Congress.

Q. Did you make a report to the Telephone Commission of Maryland of which you have spoken? A. I did.

Q. What did they do with your report? A. They adopted it and referred it to the Legislature.

Q. And what action, if any, was taken upon it by the Legislature? A. The recommendations in that report in regard to the rates charged for telephone service and for an increased rate for certain lines of service were adopted by the Legislature.

Q. Please look at defendant's Exhibit No. 6 in this case, and state whether that is a copy of the report which you made to the Telephone Commission, and of the report which that commission made to the Legislature of Maryland? A. It is.

Q. I see that your report to the Telephone Commission is dated Dec. 9th, 1895. How long after that was it that you were requested by the Chesapeake and Potomac Telephone Co. itself to make an audit of its books? A. I think it was in the
783 summer of 1897 that I was asked to make an audit of the accounts of the company. The first audit was made in the fall of 1897, and included the first three-quarters of the year. The fourth quarter of the year was made, I think, the last of January or the 1st of February of this year, as soon as the books were closed for the fiscal year 1897.

Q. What was the purpose, if you know, of the audit which you made in 1897? A. For the satisfaction of the president and board of directors that the accounts of the company had been properly kept and that its balance sheet was correct.

Q. Can you tell us whether or not that is an unusual proceeding on the part of corporations nowadays? Not at all. It is a very general thing for a corporation now to have a special audit made of its accounts.

Q. When you made your investigation on behalf of the Telephone Commission of Md. in 1895, to what extent did you personally examine the books of the company and the papers upon which the entries in the books were based? A. The examination was a very thorough one in every respect. Every entry upon the books was traced back to its original entry, and every voucher for disbursements was personally examined by

me. The disposition of all its expenses of every kind, as between the district of Maryland and the District of Columbia, was critically examined, and the distribution to the sub-expense accounts was also examined and verified.

784 Q. I see in the report which you made to the telephone commissioners for Maryland, in your report of December 9th, 1895, you say: "The system of accounting adopted by the company is remarkably thorough, clear and scientific." What is your opinion now as to the system of bookkeeping done by the company, both in 1895 and down to the time when you last examined its books? A. I think they have as good and thorough a system as any corporation I have ever examined.

Q. What can you tell us as to the manner in which that system has been carried out by the bookkeepers? A. It has been thoroughly carried out, and is a very clear statement of the operations of the company.

Q. What do you say now as to the accuracy of the statements contained in your report of December 9th, 1895, to the Telephone Commissioners of Maryland? A. That those statements are accurate and correct in every respect.

Q. What was the purpose of the examination of the company's books and accounts which you made in the spring of this year? A. The object of that examination was to ascertain whether the statistical tables, as submitted by Messrs. Haskins & Sells, were correct, and were verified by the entries upon the books of the company.

Q. For what year? A. For the period of six years.

785 Q. From 1892 to 1897, inclusive? A. From 1892 to 1897, inclusive.

Q. In this last examination, to what extent did you personally examine the books and vouchers of the company? A. I made the same critical examination of the books and vouchers as I had made in the previous examination. The period covered by my first examination I did not go over again, but from October 31, 1895, when my previous examination closed, up to the close of Haskins & Sells' examination, I went over all those portions of the account which I had not personally analyzed before.

Q. Please look at Exhibits "A," "F" and "G," in this case, being tables and statements made by Messrs. Haskins & Sells as to the financial affairs of the defendant company, and state from the result of the independent examination which you say you made in the spring of this year to what extent those tables and statements are correct? A. These statements and tables were verified by me as being correct.

Q. What do you say now as to their being a correct exhibit of what the books and papers of the company show? A. I con-

sider that they are a correct exhibit for the periods covered by the tables.

Q. I believe you have not made any examination for the present year, the period since the examination covered by these books? A. No; I have not. I have been so occupied I could not take that matter up.

786 Q. In making your investigations did you pursue exactly the same methods that were adopted by Haskins & Sells? A. I can hardly answer that question, because I was not present when their examination was made, except a few times when I came down and simply spoke to Mr. Haskins, as to how he was getting on. My examination was made independent of theirs.

Q. Did you, for yourself, calculate the expenses per stations and the receipts for telephones and the net revenue per station? A. I did.

Q. How did your results as to those matters compare with those which you found Haskins & Sells had arrived at? A. There was a variation, I think, of about two cents in the average net cost. That, I think, arose from the fact that I used a little different method from theirs, and carried out my decimals to four figures and they carried theirs to two.

Q. What special attention, if any, did you give to the items of construction and maintenance in the books of the company in these various examinations, to determine whether or not the entries to those accounts were properly made? A. The charges to construction were very carefully examined by me. As much, and probably more time was given to those charges as to the maintenance charges, in order to ascertain whether there had been any charges to plant which properly belonged in the expense account. The whole examination was a very careful and very critical one.

787 Q. What do you say whether the company, in distributing its charges to construction and maintenance, had made proper entries? A. I think if I had been the auditor of the company I would have charged to maintenance a good many items that were charged to construction.

Q. What do you say as to whether anything was charged to maintenance that should have been charged to construction? A. I think the boot was on the other leg. The maintenance charges, I think, were less than the actual outlay for maintenance.

788 Cross-examination.

By Mr. BIRNEY:

Q. Colonel, what in your opinion is properly to be included in the charge for maintenance? A. All repairs to the lines,

replacement of wornout material and everything that is necessary to keep the plant in a serviceable operating condition.

Q. Is that all? A. I think that covers it all, practically.

Q. Does the increase of capacity for service of a plant properly fall under the head of maintenance? That is to say, suppose a plant capable of serving a thousand customers a day, and that be replaced by a plant capable of serving three thousand, should the total cost of that replacement be charged to maintenance? A. Not the whole of the original cost, I should say.

Q. I speak of the whole original cost of this three thousand subscriber plant. A. I should not charge the whole of that to maintenance. I should charge it to construction—the difference between the cost of the new plant and what had been the cost of the old plant which was taken out and destroyed.

Q. Then you would not take into consideration the increased capacity for business of the new plant? A. That would be governed by the charge to construction—the difference in cost.

Q. And only in that way? A. That is all.

789 Q. You are now proceeding upon the theory that the cost in either case of so much of the plant as would serve a thousand subscribers would be the same. Suppose there be a difference in the cost. A. It does not increase your earning capacity any, and the fact that the new plant costs more than the old is no reason why you should charge to your construction account that difference.

Q. I have given you a case where the earning capacity has been increased three times over? A. In that case I should charge to construction the difference between the cost of the original plant and the cost of the new plant only.

Q. Do you not think it would be a fairer plan to the customers who are called upon to pay for this to charge to maintenance so much of the cost of the plant as would take the place of the old plant, and charge the remainder to construction? A. You have got to look upon the owners of the property as well as the customers of the concern. If I have a piece of machinery that cost me originally $2,500, and I replace it by a piece that cost me $4,000, and I could duplicate the original piece for $1,500, I should not charge $2,500 to my construction account, but only $1,500, because I have made that amount of investment in the first instance. That is the amount that my construction account is properly charged with.

790 Q. Then if the cost of a new plant, capable of serving three thousand customers, where formerly only a thousand had been served, having an increased capacity three times as great as the first, should actually cost no more, owing to a difference in the cost of materials and the cost of labor, or the like, you would charge nothing to construction?

A. Not a penny. It is not customary in corporations of any kind.

Q. You would regard that then only as a replacement? A. Only as a replacement.

Q. Although the earning capacity of the corporation were increased three times? A. Yes. I will say here that that very question has come up before me with steam roads, electric roads, and all kinds of manufacturing plants, and in my own case as the manager of a large chemical manufacturing plant, and I have invariably decided it that way.

Q. When was it you last made an examination of the accounts of this company? A. In March and April of this year.

Q. At that time what books or papers did you personally examine? A. All of the books of account and the vouchers connected therewith.

Q. By vouchers, do you mean the great number of receipts taken by the company for outlays? A. The bills for material, pay rolls, and everything of that kind, that are filed as the vouchers for the payments made by the company for its
791 various expenses.

Q. Was that for one year or a greater period? A. That was for the period from October 31, 1895, up to the close of this examination. A portion of the vouchers for 1897 I did not examine at that time, because I had previously examined them in the special audit of the company.

Q. In what way did you make the comparison between figures made by you before that time and at that time, as just stated, and the tables made up by Haskins & Sells? A. By comparing the figures on my original data and the tables made from those examinations, with the tables made up by Haskins & Sells, taking their figures through.

Q. Had you, before that time, made up tables of the Washington part of the business of this company? A. No; I separated the Washington part at that time. In the previous examination in 1895, I had to separate all of the disbursements of the Washington business from the disbursements of the Maryland business.

Q. You were then making up tables for the Maryland part of the business, were you not? A. I was, and in making those up, I had to separate the Washington disbursements.

Q. Did you make up tables of the Washington part of the business? A. There were data at that time separating the two, and then giving the amounts of the two different divisions.

Q. Did you make up any tables of the Washington
792 branch of the business at that time? A. Not at that time. I simply verified from the books, taking the total amount of disbursements and in verifying the amount that belonged to the State of Maryland and the amount that belonged to the District of Columbia.

Q. Then you made up tables covering only the Maryland part of the business, did you not? A. The distribution into sub-accounts was for Maryland. The distribution of general accounts covered both divisions.

Q. Then you made no distribution of sub-accounts? A. Not at that time.

Q. When did you do so? A. That was in March and April of this year.

Q. Over what period of time? A. For the period covered by Haskins & Sells' examination.

Q. Did you then make up tables of the Washington branch of the business independent of Haskins & Sells' accounts? A. In some sub-accounts I did, and in others I took the total statements they had made and checked them up, to save duplication of some of the figures.

Q. What do you mean by checking them up? Tell us what you did? A. Checking a statement made up by Haskins & Sells, month by month, of the distribution, going through that with the vouchers, and checking the amounts on that
793 statement, which was saving the trouble of making up on separate sheets of paper the separate sets of figures.

Q. In those accounts and tables appears in the items of expense "contributions to the sinking fund." What did you find that to be on the books? A. For the entire company, $20,000 a year.

Q. What did you understand that to be? A. A contribution toward the final extinguishment of the bonds.

Q. Of the mortgage bonds of the company? A. Of the mortgage bonds of the company.

Q. That is to say, the company had borrowed money on its mortgage bonds and made a deposit each year or oftener with trustees for application finally to the payment of the principal of the bonds? A. Yes.

Q. That was charged to expense? A. That was charged to expense account.

Q. And the interest on the bonds was also charged to expense? A. Yes, sir.

Q. How much was that a year? A. What do you mean by that?

Q. That contribution to the sinking fund, so far as it affects the Washington branch? A. $8,000 a year.

794 Q. Did you regard that deposit so made as an asset or not? A. No; I should deduct that from the liabilities of the company.

Q. That is equivalent to an asset, then, is it not? A. Not necessarily.

Q. You said that some of the recommendations made by you in your report to the Maryland Legislature were adopted by the

Legislature. In what form were they adopted, Colonel? A. By the passage of a bill indicating the toll charges of the company for toll service on the lines in the State of Maryland.

Q. Was there any increase by the Legislature of the rates for exchange station service? A. No; there was no recommendation to that effect.

Redirect examination.

By Mr. WORTHINGTON:

Q. Is this the act of the Legislature of the State of Maryland to which you have referred in your cross-examination (showing witness act, entitled "An Act to repeal section 232 B of Article 23 of the Code of Public General Laws of Maryland, entitled 'corporations,' sub-title 'telegraph companies,' as enacted by the act of 1892, chapter 387, and to re-enact the same with amendments," found on page 229 of the laws
795 of Maryland, 1896). A. That is the act passed by the State in conformity with those recommendations.

Mr. WORTHINGTON: Counsel for defendant offer this act in evidence, and by consent of counsel it is copied into the record, and is as follows:

"An act to repeal section 232 B of Article 23 of the Code of General Public Laws of Maryland, entitled 'corporations,' subtitle 'telegraph companies,' as enacted by the act of 1892, chapter 387, and to re-enact the same with amendments.

"Section 1. Be it enacted by the General Assembly of Maryland that section 232 B of article 23 of the code of Public General Laws of Maryland, entitled 'corporations,' sub-title 'telegraph companies,' as enacted by the act of 1892, chapter 387, be and the same is hereby repealed and re-enacted, so as to read as follows:

"232 B. Where any two cities, towns, or villages in the State of Maryland are connected by wire, operated, managed, controlled or owned by any individual, company or corporation, the price for the use of any telephone for the purpose of conversation between such cities, towns or villages shall, for each five minutes or fraction of five minutes of such use, not exceed the amounts hereby fixed; that is to say: where the distance does not exceed ten miles, 15 cents; where the distance
796 is more than ten miles and not more than thirty miles, 25 cents; where the distance is more than thirty miles and not more than fifty miles, one cent a mile; where the distance is more than 50 miles, 50 cents, and one-half a cent for each mile in excess of 50 miles.

"Section 2. Be it further enacted that this act shall take effect from the date of its passage.

"Approved April 2, 1896."

By Mr. WORTHINGTON:

Q. You have stated your opinion as to what entries should be made in maintenance and construction accounts respectively, when an old plant is replaced by a new one. Can you tell us whether or not your opinion is that which accountants in general, public accountants, entertain? A. I think it is; with all public accountants with whom I have been associated that is the usual course.

Q. You have said that that is the course pursued, as I understood you, by all corporations. Can you tell us to what extent it is pursued by firms and individuals engaged in manufacturing and cognate enterprises? A. I think it is generally pursued.

Q. I neglected to ask you just how it was that you came to be employed by the company to examine its accounts last March. Will you state the circumstances? A. The president of the company called me up at my office by wire and asked me to come to Washington to see him, and stated to me that—

Mr. BIRNEY: I object to the conversation.

797 A. That a bill was before Congress relating to telephone rates, and that the Senate sub-committee had employed Messrs. Haskins & Sells to make an examination of the books and accounts of the company, and that he would like me, after they had completed their examination, to go over their figures. A few days afterwards Mr. Bryan informed me that the Senate committee had given up their examination, and that Messrs. Haskins & Sells, having been selected by the Senate committee to make the examination, would go on and make an examination on behalf of the company, and that he would like me, when they had completed their work, to take it up and verify or disprove the statements made; and when they had completed their work I took the statements submitted by them and made my own examination.

JOHN R. TOMPKINS,
By the Examiner, by consent.

Subscribed and sworn to before me, this —— day of ———, 1898.

———— ————,
Examiner in Chancery.

Mr. WORTHINGTON: Counsel for defendant now offer in evidence the annual report, dated February 23, 1898, made by the president of the defendant company to its board of directors upon the operations of the company for the year ended December 31, 1897, together with the papers forming a part of that report.

798 The same is filed herewith, marked Defendant's Exhibit "R."

The defendant announces its evidence in all the cases closed.

799 DISTRICT OF COLUMBIA, *ss:*

I, JOHN W. HULSE, an Examiner in Chancery in and for the District of Columbia, do hereby certify that the foregoing depositions were taken down by me in shorthand at the times and place mentioned in the caption thereof, reduced to typewriting under my direction, compared with the original notes, and found to be correct; that the said witnesses were by me first duly sworn to tell the truth, the whole truth and nothing but the truth; that the said depositions were read over by said witnesses and by them subscribed in my presence, except as to those depositions which were signed by me by consent of counsel.

I further certify that I am not of counsel, nor in any wise interested in the result of said suit.

JOHN W. HULSE,
Examiner in Chancery.

Fees, $630.00. Paid by defendant.

800 In the Supreme Court of the District of Columbia.

JAMES F. MANNING *et al.*,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY. } No. 19,558. In Equity.

Complainants' Testimony.

DETROIT, MICHIGAN, *Jan.* 13, 1899, 11 o'clock A. M.

Met pursuant to agreement at room 1105 Majestic Building, Detroit, Michigan.

Present on behalf of the complainants, Mr. BIRNEY.
Present on behalf of the defendant, Mr. WILSON and Mr. WORTHINGTON.

WILLIAM L. HOLMES, a witness of lawful age, produced by and on behalf of the complainant, having been first duly sworn, is examined.

By Mr. BIRNEY:

Q. Please state your name, age and residence? A. William L. Holmes, age 40, Detroit, Michigan.

Q. Are you connected in any way with any telephone company, and if so, with what one and in what capacity? A. I am President of the Detroit and New State Telephone Companies; also of the Detroit Switchboard and Telephone Construction Company.

801 Q. How long has the Detroit Telephone Company been in existence? A. About two years.

Q. And the New State Telephone Company? A. I have not the exact date of its incorporation. The New State Telephone Company *was organized just about two years ago.*

Q. What is the nature of the service furnished by the New State Telephone Company? A. Everything outside of Detroit.

Q. And the Detroit Telephone Company furnishes service where? A. In Detroit.

Q. Have you been president of the Detroit Telephone Company since its organization? A. No, sir.

Q. For how long have you been? A. I was first Treasurer of the company.

Q. For how long a time? A. I have been President of the company for now, I think, something over eighteen months.

Q. And previous to that you were Treasurer? A. Treasurer of the company.

Q. Are you able to give us approximately the population of the city of Detroit? A. It is reputed to be 300,000. It was 206,000, I think, in 1890, and 235,000 in 1894, by the official State Census.

802 Q. At the time of the organization and entering into business of the Detroit Telephone Company was telephone service given here by any other company? A. Yes; by the Michigan Bell Telephone Company. I do not know that I give the exact official title of that company. It has been changed, I think, once or twice, but it is known as the Bell Company.

Q. Was that company a licensee of the American Bell Telephone Company, doing business under its patents and rights? A. It is supposed to have been, yes, sir.

Q. What were the rates charged for telephone service at that time by the company? A. The ordinary business rates—

Mr. WORTHINGTON: One moment. Counsel for the Defendant object to this question and to all testimony tending to show what were the rates for telephone service in any other city than Washington, upon the ground that the question involved in this case is what it costs to render such service in Washington, and that to go into testimony as to what is a proper charge in other cities involves also the inquiry as to the different conditions in those cities, and renders the inquiry an interminable one.

(It is agreed by and between counsel that this objection shall stand once for all as to all testimony offered on behalf of the complainants relative to the telephone service in other cities than Washington.)

A. The ordinary business rates for what is called the Blake

Transmitter were seventy-two dollars a year, and for residences it depended altogether on the distance from the
803 central exchange. My residence was a little over two miles from the central exchange, and for a long time I paid *sixty-five dollars a year for my Bell telephone. Of course* this was only for the ordinary Blake transmitter. The long distance telephones, what are known as the metallic or long distance telephones, were much higher, and were graded, I believe, on the distance from the Central Office, running in many cases, I think, in excess of one hundred and fifty dollars a year inside of the city limits.

Q. Do you recall what was the lowest rate for the metallic circuit service? A. No, sir; I do not.

Q. What is the character of the service given by your company, as between metallic and grounded circuits? A. We call our service a metallic service. Of course when I say that I do not mean that every telephone is on a metallic circuit. A great many of them are, and we are gradually and as rapidly as possible putting them in that condition.

Q. What are the rates charged by your company, and what have been the rates charged by your company, for telephone service since you commenced business? A. We operate under a franchise from the city, which regulates our rates. We have only the same rates for any distance from the central office, from any point in the city to the central office. The franchise grants us the privilege of charging forty-five dollars per year on a one year contract for business telephones, and thirty dollars a year for residences on one year contracts. As a matter of fact, however, practically all of our service is rendered at forty dollars a year for business and twenty-five dol-
804 lars a year for residences, as that is the price exacted by the franchise for three year contracts or a longer time.

Q. How many telephones have you now in operation in the city of Detroit connected with your exchange? A. On the first of January we had forty-nine hundred and thirty-six telephones.

Q. Can you tell how many you had a year ago. That is to say what has been the increase in 1898? A. I had that figure yesterday over at the office. I think the increase was six hundred, fifty a month net increase during the year. On the first of January, 1898, we had about forty-three hundred telephones in operation.

Q. What is the capital stock of your company? A. One million dollars.

Q. Is it all issued? A. No; there is only $516,000 or $517,000 of the stock issued.

Q. What is its bonded indebtedness? A. $600,000.

Q. And the bonds bear interest at what rate? A. Six per cent. unfortunately for us.

Q. What has been the financial result, Mr. Holmes, of the operations of your company? A. I can give you the exact figures of our earnings for last year, if you wish them?

Q. Yes, if you please. A. It is no secret. The cash receipts from our telephone rentals, for January, 1898, were $13,324.36.

Q. You can give them by the year. That will do.

805 A. For last year, including $19,407 of uncollected accounts, the total receipts for rentals is $165,773.97.

The operating expenses, including the salaries, printing, stationery, insurance, taxes, postage, operating girls, repairs, rent, light, and every expense of every nature, were $97,097.92. The interest on our bonds was $36,000.

Making a total of $133,097.92, including all fixed charges, leaving a balance or net profit of $32,676.05.

Q. Did you pay dividends on your capital stock? A. We paid one dividend last year; but we found it was necessary for us to put our earnings into the extension of our plant. We paid one two per cent. dividend last year. This is the Detroit Company I am speaking of.

Q. Precisely. I am limiting my inquiries to that. Have you figures before you by which you can make a similar statement as to the preceding year? A. We were not in operation the whole of the preceding year. We did not start giving service until the first of May, I think it was, the year before, and were not giving much service until the first of July.

Q. Are you extending your plant? A. Yes, sir. You mean by that, of course, whether we are putting in new telephones?

Q. Yes. A. Yes, sir.

Q. At what rate? A. The same rate.

Q. That is the rate of charges, of course. What is the monthly rate of increase in number of telephones? A.

806 I can state that for the last year we averaged a net increase for the whole year of fifty per month. Of course that means that we put in a good many more than that; but taking out telephones for bad accounts, changes, debts, and other causes, that is the net increase.

Q. Is your system aerial or underground in Detroit? A. It is very largely underground. It is underground in what we call the mile circle.

Q. Will you explain what you mean by that? A. That is a circle that is half a mile in every direction from the central office. In a number of cases we have gone outside of that circle from a business policy and put our cables underground; but everything within that circle is underground.

Q. Is that underground construction required by law or ordinance? A. Yes, sir.

Q. And that circle is fixed by the ordinance? A. Yes. I do not know that it is fixed by the ordinance, except in a general way, but it is fixed by the Board of Public Works, I think.

Q. Is it fixed by the city authorities? A. Yes, by the city authorities.

Q. You say that you have extended your underground system beyond that half mile circle? A. Yes; in several directions.

Q. What is the character of the street pavements of Detroit? A. We have asphalt and brick, principally,
807 down town.

Q. Sheet asphalt? A. Yes.

Q. And brick? A. Yes, sir; brick.

Q. That is the vitrified brick laid on edge? A. Yes.

Q. During this period of operation by your company, has the former company, the lessee of the American Bell Telephone Company, been in operation? A. Yes, sir.

Q. What has been, since you commenced operations, the rate charged by that company to subscribers? A. As far as I know their former rates continued up until the 1st of October, 1897, at which time I think it was they reduced their rates for what is known as the Blake Transmitter—the ordinary telephone.

Q. Grounded circuit, you mean? A. I speak of the telephones and not of the circuit. $36 per year for business, and $24 per year for residences.

Q. Do those rates continue to be their rates? A. I judge only from the advertisements. From what I see in the papers the last day or two, I judge they have changed their rates again.

Q. Have you those advertisements here? A. Yes, sir; here is an advertisement in the Detroit Tribune of this date.

Q. Will you please read the advertisement, which is now offered in evidence?

808 Q. The advertisement is :

"Local and long distance telephone. One way long distance transmitter business telephone, $1.50 per month. One way long distance transmitter residence telephone, $1.00 per month. Telephone No. 189. The canvasser will call to take your subscription for telephone service with the Michigan Telephone Company."

Q. What is the character of the switchboard, used in your exchange, Mr. Holmes, and what is its capacity in number of subscribers and number of lines? A. I can give you its capacity. I would not like to go into a technical description of the switchboard, because I am not an electrician.

Q. I did not ask you for that, but for its capacity. A. The

central switchboard has a capacity of 6,000 drops, six thousand telephones. Aside from that we have three sub-stations.

Q. Of what capacity? A. The ultimate capacity, you mean?

Q. Yes; of each. A. I do not know that I could tell you. I can give you an idea, pretty nearly, of how many telephones are working in the different sub-stations.

Q. Give us that, please. A. In our north office, I think there are about 250 telephones in operation. In our west office I think about 100, in our east office about the same number. Of course we build our switchboards larger than we need with the expectation that we will have a gradual growth.

809 Q. That is, you build a switchboard with 6,000 capacity? A. Yes; in the sub-stations we are not using the whole capacity of the switchboards.

Q. Are you familiar with Washington city, Mr. Holmes? A. Yes; somewhat.

Q. You have been to the city and have looked it over and know the character of its streets and pavements? A. Yes.

Q. And the general way in which the city is built? A. I am not thoroughly posted on the alleys. Of course that is an important matter in telephone construction.

Q. We have alleys in nearly all the squares. A. It is pretty near the same as Detroit.

Q. That is important in what way? A. Alleys are not usually paved as expensively as streets, and they can be torn up and a conduit laid at less expense than streets.

Q. From your observations of the two cities and your knowledge of the conditions existing in them, do you know of any reason why the cost of construction in the city of Washington should exceed the cost of construction in the city of Detroit for a telephone plant?

Mr. WORTHINGTON: We object to that question, on the ground, in the first place, that it is not a proper subject for expert testimony; in the second place, if it is, Mr. Holmes has not been shown to be qualified as an expert on that subject.

A. I do not know any reason, no, sir.

810 Q. Is there any reason within your knowledge why the cost of operating or maintaining a telephone plant in the city of Washington should exceed the cost of operating and maintaining a telephone plant in the city of Detroit?

Mr. WORTHINGTON: We make the same objection on the same grounds.

A. No, sir; I do not see any reason, if you base your statement on practically the same size of exchange.

Q. Have you familiarized yourself with the rates of charges prevailing in other territories than in Michigan? A. In a general way; yes, sir.

Q. Are you familiar with the rates charged in Canada? A. Yes, sir.

Q. In the province of Ontario? A. Yes, sir. When I say "familiar," I do not mean as to every point. In a general way I am familiar.

Q. How many companies operate in the Canadian territory, Mr. Holmes, say in the province of Ontario? A. I think there is only one.

Q. Is that a licensee of the American Bell Telephone Company? A. That question I cannot answer. It is called the Bell Telephone Company.

Q. Do you know the principal cities in which that company operates? A. Yes, sir.

Q. Which are they? A. Toronto, Hamilton, London,—you are speaking now of Ontario?

Q. Yes; of Ontario. What are the charges for tel-
811 ephone service made by that company in those different cities? A. The business rate in Toronto, I believe, is $45 and the residence rate $25 per year.

Q. And the other cities? A. I cannot speak definitely regarding the exact price in Hamilton and London.

Q. Are the rates, in any of those other places, higher than in Toronto? A. I think they are somewhat lower than in Toronto.

Q. Can you say positively as to whether or not they are higher or lower, Mr. Holmes? A. I am not in a position to say.

Q. Do you know about how long that company has been operating in Ontario? A. My thought is that it has been operating as long as telephones have been in use over there.

Q. How long have you known of their actual operating over there? A. I have known of their operating two years. I was not thinking of the telephone business much before two years ago.

Q. Do you know the market value of the stock of that Canadian company? A. I could not say exactly. The value of the stock is high. Do you want to know what I think?

Q. I want your best information.

Mr. WORTHINGTON: I object to that for the reason that it is plain the witness is not testifying from personal knowledge.

812 A. In a general way I am posted on it. If you want a definite statement, I cannot give it.

Q. That stock fluctuates, from time to time, I suppose? A. Yes.

Q. I want your best information as to the last market prices with which you are familiar.

Mr. WORTHINGTON: I object to this further for the reason that the market value of stock is not an indication of whether the company is making money, or how much it is making.

A. I understand the stock is quoted at about one hundred and seventy, and the five per cent. bonds, I understand, are quoted above one hundred and ten or about one hundred and ten.

Q. The par value of each being what? A. The par value of each bond is one hundred dollars. I do not know the par value of the stock, presumably one hundred dollars.

Mr. WORTHINGTON: I object to the witness's presumptions as to the par value of the Canadian Company's stock.

By Mr. BIRNEY:

Q. Who are the general officers of your company? That is to say what are the general offices of your company? A. President, Vice President, Secretary and Treasurer, or Secretary-Treasurer. That office is filled by one person. That is what you mean by offices, is it, including the General Superintendent?

813 Q. Yes. You have also a general superintendent? A. Yes, sir.

Q. What are his duties in a general way, Mr. Holmes? A. He has general charge of the construction and maintenance of the plant.

Q. Who is that general superintendent? A. Mr. T. F. Ahern.

Q. Turning now to the New State Telephone Company of which you are president, please state in what cities or towns of Michigan that company operates. A. That will be pretty hard to state. We have covered a very large portion of the eastern and central sections of the State. According to the last reports from the auditor there were one hundred and thirty-two or thirty-four telephone exchanges in the system and about three thousand, or very close to three thousand, telephones in operation.

Mr. WORTHINGTON: That is, outside of Detroit? A. Outside of Detroit; yes, sir. (After examining book.) 134 exchanges was the number reported in operation the first day of November.

By Mr. BIRNEY:

Q. What are the largest exchanges in that system, and how many telephones are there in each? A. Ann Arbor. We had close to five hundred telephones in operation in Ann Arbor. In Pontiac we had about three hundred; in Ypsilanti, about two hundred; in Sault Ste. Marie we had two hundred and eleven

telephones in operation; in La Peer we had a hundred and thirty-five at that time; in Ionia we had one hundred and twenty-nine in operation; in Mt. Clemens we had a hundred
814 and eighty-nine at that time reported as operating.

Q. Is there any inter-communication between those cities? A. On our system, do you mean?

Q. Yes. A. Oh, yes. We had a hundred and forty-five toll offices from which we were giving service.

By Mr. WORTHINGTON:

Q. That is, in the New State Company? A. The New State Company.

By Mr. BIRNEY:

Q. What are the rates charged by that company?

Mr. WORTHINGTON: Is that in all these cities?

Mr. BIRNEY: Yes.

A. Our general rates are $24 for business and $18 for residences, outside of the city of Detroit, except where we use the party line system, where we make a lower rate.

Q. How long has that company been operating in these different places? A. Here is the souvenir toll coupon (indicating a paper hanging on the wall), dated May 4th, 1897. That is the first one issued.

Q. What has been the financial result of the operations of the company? A. What do you mean by that?

Q. Have you succeeded? Have you made money? Have you made your expenses? A. We have made money; yes. We have not made all the money we wanted to make. We have not made all we expected to make, but we have made
815 money. Here is a statement prepared by the auditor's department up to October 31st—

Mr. WORTHINGTON: I object to the witness testifying from a report unless he has some personal knowledge of the facts, on the ground that the report and the man who made it are the proper witnesses.

By Mr. BIRNEY:

Q. Is it a report made to you in your official capacity as president of the company, by the auditor of the company? A. Yes.

Q. In the regular course of his duties? A. Yes.

Q. Please state it? A. This shows the net earnings to December 31st, 1897, $6,505.03.

Q. By net earnings what do you mean? Earnings in excess of all outlays? A. Yes, sir. There had been a previous report made, and this is his balance from that time. For January, 1898, the net earnings were $1,896.51.

Q. For that month only? A. For that month. For February, 1898, $2,137.45; for March, 1898, $2,668.44; for April, 1898, $2,953.86. The total net earnings to April 30th, 1898, were $16,181.29, at which time we declared a quarterly dividend of two per cent, amounting to $6,682.00, leaving a surplus of $9,499.29. The net earnings for May, 1898, were $3,140.09; for June, 1898, $3,058.72; for July, 1898, $3,320.43; which, added to the surplus of April 30th, makes $19,018.53 on the 1st of August, at which time we declared a second quarterly
816 dividend of two per cent, amounting to $9,096.00, leaving a surplus on July 31st, 1898, of $9,922.53. The net earnings for August, 1898, were $3,839.45; for September, 1898, $3,628.65; for October, 1898, $4,040.98; at which time we declared a third quarterly dividend, amounting to $10,440, leaving a surplus on October 31st, 1898, of $11,001.61.

Q. What is the capital stock of that company? A. One million dollars.

Q. And the amount issued? A. There is about $700,000 issued now.

Q. It was on that last amount you paid the last dividend? A. No; we did not have that much issued.

By Mr. WORTHINGTON:

Q. The dividend was two per cent on the amount of stock that was out at the time the dividend was paid. Is that right? A. It was a two per cent dividend on that amount of stock.

Q. What amount of stock? A. Whatever it figures there. The dividend was $10,440. That would be two per cent on $522,000.

By Mr. BIRNEY:

Q. Have you a statement of the operating expenses; that is to say, the expenses of the operating room of the Detroit Telephone Company for the past year? A. I have a statement up to a certain point, up to October 31st, showing the oper-
817 ating expenses. This is the Detroit Company you are speaking of?

Q. Yes. A. From the 1st of January. It is for the 1st ten months of 1898. The operating expenses were $35,044.11.

Q. Under what heads do you keep your accounts, in addition to that of operating? A. Salaries, stationery and printing, operating, insurance and taxes, postage, miscellaneous instruments and lines, rent, light, cable, etc.

Q. What is the amount of the salaries paid? A. The salaries for the first ten months of the year were $11,857.02.

Q. Who are the officers whose salaries are covered by that? A. All salaries outside of the operating and maintenance departments.

Q. Have you a separate account as to maintenance, showing the cost of maintenance during that period as distinguished from the operating and the general accounts? A. I have, those I have read. They are itemized here if you want them.

Q. Give them, if you will? A. You have the salaries and you have the operating.

Mr. WORTHINGTON: I object again because the witness is reading from a statement prepared by somebody else. He is not speaking of his own personal knowledge, or putting in the statement and proving how it was made.

By Mr. BIRNEY:

Q. You are testifying from a statement which you hold
818 in your hand, are you not? A. Yes.

Q. Will you please state how that statement was made? A. The statement was prepared for me by our bookkeeper.

Q. As far as you have knowledge, is it correct? A. Yes, sir.

Mr. WORTHINGTON: I object to that because it does not appear that he has any knowledge, and if so, to what extent.

By Mr. BIRNEY:

Q. How familiar are you with the daily operations of the office, Mr. Holmes? A. I am brought in contact with them.

Q. Constantly? A. Almost constantly.

Q. Are you able to tell from your own knowledge whether that statement is approximately or exactly correct? A. I believe it to be exactly correct. I have every confidence in our bookkeeper.

Mr. WORTHINGTON: I object again because it now appears from the witness's statement that he is testifying purely from hearsay evidence.

By Mr. BIRNEY:

Q. Have you sufficient knowledge of your own to say whether that statement of the bookkeeper, aside from your confidence in him, is or is not correct?

Mr. WORTHINGTON: I object again because the witness is not shown to have sufficient knowledge to give an opinion.

819 A. This statement came to me in my official capacity as president from the person who was in charge of our books.

Q. Please state what are the items? A. Stationery and printing is $2,612.03. I have here a statement up to the first of the year, which I have no objection to your having, because

it is official. This other statement for two months was guess work. It is a history of ten months and an estimate for two months. I do not care to have that estimate go out.

Q. What have you now in your hand? A. This is a statement for the twelve months for the whole year, but the items of expense are not in there. It is a summary of the expense.

Q. This statement that you now hand me is a statement of the monthly receipts of your telephone company during 1898 and a statement of the expenses of the company, including its interest on its bonds, is it not? A. Yes, sir.

Mr. BIRNEY: I offer this paper in evidence.

The WITNESS: You have incorporated those figures before.

Mr. WORTHINGTON: We object to the statement on the ground that it not only does not appear that it is prepared by the witness from his personal knowledge, but affirmatively appears that it was prepared by somebody else, and that he has no such knowledge as would enable him to testify as to its accuracy.

This paper is appended hereto, marked Complainant's Exhibit No. 1, and is in the words and figures following,
820 to wit:

COMPLAINANTS' EXHIBIT, No. 1.

Statement of Detroit Telephone Company, January 1, 1899.

Income for 1898 *as follows:*

Cash receipts from telephone rentals	January, 1898		$13,324.36
" "	February, "		12 083.53
" "	March, "		10,247.09
" "	April, "		13,933.87
" "	May, "		13,941.34
" "	June, "		9,414.56
" "	July, "		13,589.96
" "	August, "		12.874.51
" "	September, "		9,216.96
" "	October, "		16,366.19
" "	November, "		12.762.49
" "	December, "		8,611.30
Uncollected accounts			19,407.81
			165,773.97

Operating expenses for 1898 *as follows:*

Total operating expenses, including salaries, printing, stationery, insurance, taxes, postage, operating, girls, repairs, rent, light and every expense of every nature	$97,097.92	
Interest on bonds, 6 per cent. on $600,000	36,000.00	
		133,097.92
Balance net profit		32,676.05

Being 6.28 per cent. on $520,000.

Actual number of telephones in service January 1, 1899, 4,936.

821 By Mr. BIRNEY:

Q. Please state how the quality of your service, rendered your subscribers, compares with the quality of service rendered by the Michigan Telephone Company, your competitor? A. Of course we think it is better.

Mr. WORTHINGTON: Objected to on the ground that the witness's knowledge to make the comparison does not appear.

Cross-examination.

By Mr. WORTHINGTON:

Q. In what place is this testimony being taken? A. This office.

Q. Yes; describe it so it will appear on the record. A. This is my private office.

Q. Just state the number and street and the name of the building? A. This is 1101-5 Majestic Building, Detroit.

Q. I perceive from the sign on the door that you are a real estate agent? A. I am not a real estate agent; no.

Q. You deal in real estate? A. Yes.

Q. Where is the office of the Detroit Telephone Company, of which you are president? A. 238 Griswold street.

Q. How far is that from here? A. About two blocks.

822 Q. Do you know why the testimony was taken at your office instead of at the office of the company? A. I suppose it was because it was more convenient to me.

Q. Are there a number of other witnesses to be examined in relation to the affairs of your company? A. I don't know anything about it. I understand Mr. Ahern is to be examined.

Q. Has it been arranged that he shall be examined at your office and not at the company's office, or do you know? A. No; I presume he will have to be seen at his house.

Q. How long has the office of the Detroit company of which you are president been at this place on Griswold street? A. It has always been there.

Q. Are its books and papers all there? A. Yes, sir.

Q. What is the name of the auditor or bookkeeper of whom you have spoken who prepared the statement from which you have been testifying? A. Mr. W. H. Hall? Are you speaking of the Detroit company now?

Q. Yes; of the Detroit company alone for the present. A. W. H. Hall.

Q. What is his position? A. Bookkeeper.

Q. Chief bookkeeper? A. Yes, sir.

Q. How long has he held that place? A. Since the company was organized.

823 Q. Where is he to-day? A. He is at the office, I judge.

Q. Is he well? A. I think he is.

Q. Who are the officers of the Detroit Telephone Company

besides yourself? A. Mr. Charles Flowers is vice-president, Mr. Edward H. Parker is secretary-treasurer.

Q. Who compose the board of directors? A. At the present moment, you mean?

Q. Yes. A. The other members of the board are Mr. Julius Stroh, Mr. C. P. Collins, Mr. A. I. McLeod, Mr. W. C. Sterling, Jr., of Munroe, Mr. John T. Holmes, Mr. Hugh O'Connor.

Q. That makes eight with the three officers, who, I suppose, are ex officio members of the board. A. Yes; they are all members of the board. Also Mr. T. F. Ahern and Mr. W. A. Childs, of Calumet. There are ten on the board.

Q. How long have these men whose names you have given us composed the board of directors of the Detroit Telephone Company? A. The most of them have been on the board since it started.

Q. If any of them has recently come upon the board give his name? A. Mr. Sterling, Jr., was appointed to fill a vacancy caused by the resignation of Capt. Cornelius Gardner. John T. Holmes was appointed to fill a vacancy caused by the
824 resignation of Mr. F. A. Verner.

Q. Is Mr. John T. Holmes related to you? A. Yes; he is my brother.

Q. Are there any other recent appointees on the board? A. No.

Q. Who are the officers of the Switchboard and Construction Company of which you have spoken? A. I am president of the company; Mr. Parker is vice-president.

Q. Give his full name, please. A. Edward H. Parker.

Q. A Detroit man? A. Yes. Mr. A. I. McLeod is secretary and treasurer.

Q. Who compose the board of directors of that company? A. Aside from those, Mr. Collins, Mr. George A. Beaton, Mr. W. C. Sterling, Jr., Mr. John T. Holmes, Mr. Hugh O'Connor.

Q. Are there but seven members of that board? A. Is that all you have there, with the officers?

Q. Yes; you have given us three officers and five others, which makes eight. Are there only eight members? A. That is all.

Q. Is Mr. Stroh connected with the company? A. No.

Q. Has he been at any time? A. Yes.

825 Q. When and in what way? A. Mr. Stroh was a director of the company for, I should think, fifteen months.

Q. From about fifteen months ago? A. Yes. He ceased about fifteen months ago.

Q. Is Mr. Ahern connected with that company, or has he been? A. Mr. Ahern is a director. I omitted his name.

Q. And Mr. W. A. Childs? A. He is not a director.

Q. Has he been one? A. No.

Q. He was never connected with the company? A. No.

Q. Where does he live? A. Calumet.

Q. That is in Michigan? A. Yes.

Q. What is the capital stock of the Switchboard and Construction Company? A. $250,000.

Q. Who are the officers of the New State Telephone Company? A. I am president of it.

Q. Do you know who is treasurer of the New State Company, of which you are president? A. Give me a moment to think. We have been recently making a change in our officers and in the treasurer, on account of facilities for doing the work.

826 Q. When was that change made? A. A month or so ago.

Q. Can you recall who was the treasurer before that change was made of the New State Telephone Company? A. Mr. Flowers has been treasurer of the New State Telephone Company almost ever since its organization. I was thinking he was now.

Q. But you are not sure? A. (After a pause.) I won't swear on that point.

Q. Who are the other officers of the New State Telephone Company? A. I won't swear on that point.

Q. Who compose its board of directors? A. Mr. Flowers, Mr. Sterling—

Q. That is the Sterling, Jr., who has been mentioned already twice? A. Yes; Mr. O'Connor, Mr. McLeod, Mr. Parker, Mr. John T. Holmes, Mr. R. G. Hart, of La Peer.

Q. Is that all? A. I think so.

Q. You are not sure? A. I could verify it.

Q. I say you are not sure that you are able to state who compose the board of directors of the New State Telephone Company, of which you are president? A. Yes; I am sure of that.

Q. Are you sure you have stated them all? A. I am not sure I have stated them all, but I can do it.

827 (The stenographer here reads the witness's testimony just given, as to who compose the board of directors of the New State Telephone Company.)

A. I think that is all.

Q. Are you sure that is all? A. I think so; yes.

Q. How many directors has the New State Telephone Company? A. How many are there there?

Q. I would like you to answer, Mr. Holmes, if you can, how many directors you have, without having them counted up, so you can tell. I think as president of the company you ought to know how many directors it has. A. I have given the directors.

Q. Are any of these persons whose names you have given us

as directors of the New State Telephone Company recent additions to that board of directors? A. Mr. Hart is a recent addition.

Q. Whose place did he take? A. He filled the vacancy occasioned by Mr. F. A. Verner's resignation.

Q. The same Mr. Verner who was a member of the board of the Switchboard and Construction Company? A. Yes.

Q. Where is the office of the New State Telephone Company? A. It is at 238 Griswold street.

Q. From whom did you obtain the statistics which you have given us as to the financial affairs of that company? A.
828 From the auditor, Mr. C. J. Akin.

Q. Where is he to-day? A. I don't know. I suppose he is over there.

Q. When did you last know of his whereabouts? A. I saw him yesterday.

Q. Was he in fair health? A. Yes.

Q. Are the books of that company over there? A. Yes.

Q. Are they kept in the same office in which the books of the Detroit Telephone Company are kept? A. No.

Q. The adjoining offices? A. Yes.

Q. All connected together? A. Yes.

Q. Where is the office, if it has any office of the—what is the full name of that Switchboard Company? A. Detroit Switchboard and Telephone Construction Company.

Q. Where is the office of the Detroit Switchboard and Telephone Construction Company, which hereafter, for brevity, I shall call the Switchboard Company? A. The offices are on Lafayette avenue, near 7th.

Q. How long have they been there? A. They have been there since the company was started.

Q. How far is that from the office of the Detroit Telephone Company? A. About three-quarters of a mile, I should
829 think.

Q. Does that company have a set of books and bookkeepers? A. Yes.

Q. Have you obtained from that company any information which you have imparted to us this morning? A. No.

Q. What is the style of the office in which the books are kept, or, rather, the officer who has charge of them, speaking now of the Switchboard Company? A. Bookkeeper.

Q. What is his name? A. Mr. Fox.

Q. Full name, please. A. William L., I think it is.

Q. He lives in Detroit? A. Yes.

Q. And is in good health, as far as you know? A. As far as I know.

Q. How long has he held the place? A. He has held it for over a year.

Q. When the Detroit Telephone Company was organized, did it do itself by days' work, the constructions of its plant, or did it have a contract with somebody else to do it? A. It did its own construction.

Q. What, if anything, had the Switchboard Company to do with it? A. Nothing.

Q. Has the Switchboard Company done any work in the construction of the telephone plant in Detroit? A. Very little if any.

830 Q. Did the Detroit Company construct its conduits by days' work? A. Yes.

Q. And in the same way put up its poles and its overhead system generally? A. Yes, sir.

Q. Were accurate accounts kept of the cost of all parts of the work? A. Yes, sir.

Q. And the books of the company will show just what that was? A. Yes, sir.

Q. Has the Switchboard Company had anything to do with the construction of telephone plants in Michigan for the New State Company? A. It has constructed them all.

Q. Under contracts with the New State Company? A. Yes, sir.

Q. By whom were those contracts made and authorized on behalf of the Switchboard Company? A. By the proper authorities.

Q. Who were they? A. It was done by the board.

Q. By the board of directors? A. By the board of directors.

Q. By whom were those contracts made and authorized on behalf of the New State Company? A. By the board.

Q. The boards in the two cases being practically the
831 same? A. There were some distinguishing features.

Q. The majority of each board composed of the same persons? A. Yes.

Q. A large majority? A. Yes. Do you want to know what the contract was?

Q. You have told us what the rates of the licensee of the Bell Telephone Company here were for what you call the Blake transmitter. Did it have at the time the Detroit Telephone Company was started, so far as you know, metallic circuits? A. Yes; it had long distance telephones.

Q. It had long distance telephone apparatus? A. Yes.

Q. Do you know what its rates were at that time for apparatus of that kind? A. Of course they were a good deal higher than the Blake transmitter, but I cannot give you the figures.

Q. You have given these rates, as I understand, at the present time or since your company was organized for what you call the Blake transmitter service. A. I am not speaking of

the long distance service in either case because that varies according to the distance from the central office, and I am not thoroughly posted on it.

Q. I wish you would explain just what you mean in speaking of the Bell Company here—what distinction do you make between its long distance service and the Blake trans-
832 mitter? A. It is quite a different service and it is entirely a different charge, as I understand it.

Q. What is the difference in the service? A. You mean the technical difference?

Q. Yes. A. I do not know.

Q. You do not know what it is? A. I do not?

Q. What personal knowledge have you as to the manner in which the books of the Detroit Telephone Company are kept? What are the names of the books which it keeps at the present time? A. Do you mean all the books?

Q. Yes; all of them you know from personal knowledge. A. I would not like to give testimony on that.

Q. Why? A. It is not a matter that I have any distinct recollection in regard to. I don't go over the books.

Q. Then it is hardly necessary to ask you if you have any personal knowledge as to the system of entries? A. No.

Q. And how the accounts are kept? A. No; I have a general knowledge, but I am not in charge of the office.

Q. That general knowledge is about those subjects. When you want any information which the books will show or ought to show you call for it and it is furnished you? A. That is all.

Q. You do not yourself examine the books to see
833 whether the information is correct, or how the results are arrived at? A. No, sir.

Q. What, if anything, do you have to do with directing how certain expenditures or any expenditures or receipts of the company shall be entered? A. No, sir.

Q. Who determines that? A. The secretary-treasurer of the company, Mr. Parker.

Q. Who determined it before Mr. Parker became the secretary-treasurer? A. Mr. Verner was in charge there before Mr. Parker took charge.

Q. Is Mr. Parker here now? A. Yes.

Q. Is Mr. Verner here, too? A. No; I don't think he is in the city.

Q. Where is he? A. I give it up. He lives in the city, but he travels.

Q. He comes here from time to time? A. Yes.

Q. He is easily accessible, I suppose, if anybody wants to find him? A. Oh, yes.

Q. He is not a fugitive from justice? A. No; not so far as I know.

Q. I wish you would state the process, if you can, of bookkeeping in the Detroit Telephone Company from the time that its service is rendered or an obligation of any kind is incurred and paid, down to the time it figures in the reports which
834 are made to the board of directors, showing the financial condition of the company? A. I would rather not undertake to do that.

Q. You could not do it at all, could you? A. I might do it, but in a very faltering manner.

Q. Let me take one illustration. Do you know what items are charged to maintenance and what to construction in your books? A. I know that there are strict orders given to have things properly chargeable to maintenance charged to maintenance.

Q. I have no doubt of that, but I want to know if you can tell us, as a matter of fact, the division which is made on your books between maintenance and construction? A. I cannot.

Q. When you have been testifying here as to the information given to you by somebody else as to the cost of maintenance in your plant, you do not know what it is? A. In a general way.

Q. In a general way what is it? A. Everything that does not increase the earning power of the plant.

Q. If it increases the earning power of the plant it is charged to construction? A. It is properly chargeable to construction. For instance, if we put in ten new telephones to-day, and we think that is an increase in the earning power of the plant, we charge it to construction.

Q. All the expense of putting in a new telephone for a
835 subscriber is chargeable to construction? A. No; I do not understand it so.

Q. Do you know anything about it? A. Yes; I think I do.

Q. What do you know about it? What is done in that case, and tell us how you know it? A. I am not in a position to absolutely know this. If you want the information from that standpoint I cannot give it to you.

Q. Who could? A. Mr. Ahern.

Q. Suppose, Mr. Holmes, that your company puts in a new telephone with its connecting apparatus in the office of a new subscriber to-day; what proportion of that expense or what part of it is charged to construction and what to maintenance, or is it all charged to construction or all to maintenance? A. So far as the orders of the board go—the general instructions—nothing is charged to maintenance that increases the earning power of the plant.

Q. You do not know, then, whether in carrying out that instruction when a new telephone is put in, it is all charged to construction or all to maintenance, or a part to each? A. I

have no reason to doubt that these instructions of the board are carried out.

Q. What would the instructions of the board, according to your understanding of them, require in that case? A. To put in a new telephone?

836 Q. Yes. A. It would depend upon whether it replaced an old one.

Q. Suppose it did not replace an old one? A. If it increases the earning power of the plant, it should be charged to construction.

Q. You do not know whether that is done on your books? A. I think it is.

Q. Why do you think so? A. Simply because of the general orders.

Q. Suppose the subscriber gives up his telephone, which has been put in in that way. There is some expense then in taking it out, I presume. How is that charged? A. That is chargeable to maintenance.

Q. And so your subscribers, I suppose, change. As in all other exchanges, you are constantly having subscribers going out and new ones coming in? A. Yes.

Q. Your understanding is that the entire expense of putting in the new subscribers' instruments and connecting wires is all charged to construction. A. My understanding is that all changes of all kinds which do not increase the earning power of the plant are chargeable to maintenance.

Q. You will perceive that you are not answering the question I have asked you, which is, whether the expense of putting in the instruments for new subscribers and connecting

837 the wires is all charged to construction? A. I think, as a matter of fact, it has not all been charged. Mr. Ahern can give you better information about that, though, than I can.

Q. Did you not say a few minutes ago that you understood it was all charged to construction? A. The general orders of the company are that nothing shall be charged to maintenance that does not increase the earning power of the plant.

Q. I am not talking about generalities. A. When you get down to details, you get out of my province.

Q. I am not asking about generalities. I am asking what is done by your company when a new telephone is put in for a new subscriber, in reference to the manner of charging the expense on the books. I have understood you to say that your understanding is it was all charged to construction. A. Our plant has never yet been finished. We have never yet caught up with our subscribers. As a matter of fact to-day we have at least fifty subscribers to put in service. When we put those fifty in service, new subscribers, we charge it to construction, of course.

What we would do when the plant was complete might be a different thing, but so far we have kept a construction account.

Q. About how many subscribers, since your company began business, have dropped out? A. I think a thousand.

Q. About a thousand? A. Yes.

838 Q. According to your understanding, the expense of putting in all those telephones has been charged to construction and stands charged to construction to-day? A. Of putting in all those telephones?

Q. Yes. A. Of putting in the telephones—I think that is right.

Q. What was the expense to your company of each one of those one thousand telephone installations? A. I would not like to answer that question.

Q. You have been telling us how much your company earns and pays out. Can you not tell us how much it costs to put in a telephone system in a new subscriber's office about? A. No; I would not undertake to do that.

Q. Could you not approximate it? A. I would not undertake to do so.

Q. Is it because you do not know or because you are unwilling to do so? A. I am not unwilling to tell you anything I know, but I don't know that.

Q. Do you know what your company paid per foot for laying the conduit which is laid in this city? A. I cannot give you exact information about that.

Q. Do you know how far below the surface of the ground those conduits are? A. No; I do not.

Q. Do you know what proportion of those conduits are laid upon streets which were paved with sheet asphalt? A.

839 No, sir.

Q. Do you know how many miles of duct you have in your conduits? A. I only know from the general superintendent's report. You can get that direct from him.

Q. That is Mr. Ahern? A. Mr. Ahern.

Q. Mr. Ahern is one of your directors and is also your general superintendent? A. Yes, sir.

Q. And it is his business to have constant watch over your plant and to attend to your operations generally? A. Yes.

Q. Does he devote himself exclusively to that? A. He has practically until within a few weeks. He has been constructing an exchange in New Orleans and he has been giving that his attention.

Q. How long has he been away at New Orleans? A. He has been away at different times two or three weeks at a time.

Q. He is to go down to New Orleans in a day or two, is he not, as soon as he gets well enough to go? A. Yes; within a few days.

Q. Who superintends your business plant here while he is away? A. He has his assistants.

Q. Can you tell me enough about your books to know what allowance is made for depreciation of plant? A. No,
840 sir.

Q. Can you tell us of your own knowledge whether your plant now is in as good condition as it was when it was put down, without any deterioration—either the underground or the overhead? A. I think it is in better condition, as a matter of fact. When we built many of our telephones they were not on metallic circuits, that are now.

Q. I am not speaking of that. I am speaking, for instance, of the poles you erected. How many poles have you in Detroit? A. I cannot answer that.

Q. Can you give me any approximation to it? A. No.

Q. Can you tell me whether or not those poles are in as good condition as when they were put up, two years ago? A. We had a storm here a few weeks ago, and some of them are not.

Q. What was the date of that storm? A. I can't give you the exact date.

Q. About how long ago? A. About four weeks, I should think.

Q. What was the nature of the storm? A. It was a sleet and wind storm.

Q. What damage, if any, did it do to your overhead system? A. It did us a great deal of damage. We made an estimate soon after the storm. It cost us a little over ten thousand dollars.

841 Q. You have not had any experience of that kind before? A. Not so severe, and we don't want to have any more.

Q. What was the most severe experience of that kind that you had before that? A. We haven't had anything that has really done us any serious damage. We have had electric crosses and burned out telephones, and we have lost a few telephones at a time.

Q. This is the first severe storm you have had? A. The first severe storm.

Q. Has your plant been restored to the condition in which it was before the storm; in other words, have the damages been repaired? A. Yes; I think so.

Q. Do you know whether the expense of that work was charged to maintenance or construction? A. It was charged to maintenance.

Q. How do you know that? A. Because that is the instruction.

Q. You know that was the instruction that was given, and

you suppose your bookkeepers are carrying out your instructions? A. Yes.

Q. Otherwise than that you have no knowledge? A. No.

Q. What is your salary as president of the Detroit Telephone Company, and what has it been since the organization of the company? A. For a time I got one hundred dollars a
842 month as salary from the Detroit Telephone Company. Then I got fifty dollars a month and now I am not getting anything.

Q. Why is it that your salary has been reduced just one-half and then to nothing? A. I took the position of president of the company simply to help the company out, not because I expected to give any great amount of time to it. Q. Then the item of salaries does not include anything for the president? A. It does for last year. I was getting a salary last year.

Q. In 1898? A. In 1898.

Q. Down to what time? A. The 1st of January.

Q. Your salary was fifty dollars a month during that year? A. It was a hundred dollars a month a part of the time and part of the time fifty dollars.

Q. When was the change made? A. I don't know. It was made at my suggestion. I think it was about the 1st of September.

Q. Why, if the company was in such a flourishing condition, did you propose to have your salary abolished? A. I did not think I was giving the company enough service to draw any particular amount of salary. I draw a salary from the Switchboard Company and I draw a little salary from the New State Company. The telephone business is not my business any way. I have my own business to attend to.

843 Q. You attend to your business and you do not have much to do with the affairs of the Detroit Telephone Company? A. Yes; I have a good deal to do with them, but I don't make it my business.

Q. Why is it you do it without any compensation Mr. Holmes? A. I haven't been doing it without compensation up to the 1st of January.

Q. Why is it you are doing it now without any compensation? A. The Detroit Telephone Company, as you see from our report, which we have been very candid in giving, is not making any very large amount of money. Our rates here are too low. As a matter of fact, in a city of this size, our rates ought to be higher than they are; and it is only by very careful management that the company can make even six per cent on its stock.

Q. In order to enable it to pay dividends, you find it necessary for the president to serve without a salary.

Mr. BIRNEY: That is objected to as not being at all what the witness has stated, as not being a consequence of his statement.

A. I think there has been a tendency in the telephone business to give too cheap rates. Our rates here should be $48 for business and $36 for residences, somewhat higher than they are now, in order to take care of the contingencies and unexpected expenses that would naturally arise in the telephone business.

844 Q. Then you find that the charter which you accepted fixes rates which are not remunerative? A. They are as remunerative as our statement shows, and we think we can get our expenses down considerably lower. We think we can earn six per cent on our stock.

Q. One way to reduce expenses is to get the president to serve without a salary? A. Yes; that is a way, if he is willing.

Q. What is the salary of the vice-president? A. None.

Q. What is the salary of your secretary-treasurer? A. Two hundred dollars a month. It was two hundred and fifty dollars a month until the first of the year. We have a secretary-treasurer who is a man of considerable means, and has other interests, and he wanted to give a little of his time to his own affairs, and he thought he could unload some of the details on some of his subordinates.

Q. So he voluntarily consented to a reduction of his salary from $250 to $200 per month? A. To $200 a month.

Q. What is his name? A. Edward H. Parker.

Q. What are the general officers of the company receiving salary? A. None except the general superintendent.

Q. What compensation does he receive? A. His salary is divided between the three companies, the New State, the Detroit and the Switchboard Company. I think his com-

845 pensation from the Detroit Company is now only fifty dollars a month, and the same from the New State Company. His principal salary comes from the Switchboard Company because he is giving that his principal attention.

Q. How much does it pay him? A. It is either $250 or $300 per month. It was $250, but I think it has been raised.

Q. You say that the compensation that he now receives from the Detroit Telephone Company is fifty dollars per month? A. Fifty dollars a month. He is simply in a supervisory position.

Q. Was it more than that at one time? A. Yes; he got his whole salary at that time.

Q. How much? A. $250.

Q. It was reduced from $250 to $50? A. It has not been reduced, but it has been arranged with the other companies.

Q. His salary from the Detroit Company is reduced from $250 to $50? A. Yes.

Q. When was that reduction made? A. That was last fall, at the time we began the construction at New Orleans.

Q. His salary has been reduced and he is devoting less of his time to the affairs of the Detroit Telephone Company? A. Yes.

846 Q. Are there any other persons in your company who receive annual salaries? A. I don't know.

Q. I mean in the Detroit Telephone Company. A. Do you mean any officers in the company, directors or what?

Q. I mean any parties to whom you pay annual salaries or compensation. A. We pay all of our bookkeepers and quite a number of the employes over there annual salaries.

Q. Mr. Hall is your principal bookkeeper? A. Yes.

Q. What do you pay him a year? A. I think we pay him $100 per month.

Q. How long have you paid him that? Are you sure that that is his salary at present? A. I think it is.

Q. How long have you paid him that? A. Almost from the beginning of the company; certainly from the time we began giving service.

Q. There has been no reduction in his compensation? A. No.

Q. How many assistants has he and what do they receive per annum? A. I cannot tell you that. There has been no reduction in the salaries of our company except on the part of the individuals, who have been wanting to give more time to their own affairs, and voluntarily requested that their salaries be cut off.

847 Q. Whose business is it to superintend the outside work of your local company, the Detroit company? A. Mr. Ahern has just been rearranging that, and can give you all that information.

Q. You do not know? A. I wouldn't like to say.

Q. Whose business is it to attend to the purchasing department of your Detroit Company? A. Mr. Parker.

Q. That comes in the duties of the Secretary-Treasurer? A. Yes, sir.

Q. You have no person whose special business it is? A. No.

Q. From whom do you purchase your principal supplies? A. Anybody who will get them out cheapest.

Q. Is there any particular person or particular firm or corporation with whom you happen to deal? A. We deal with a great many firms.

Q. Can you tell me what you pay for the best cable, which you get—the largest cable? A. No; I cannot.

Q. What kinds of cable do you use? A. Do you mean whose make?

Q. Yes; and how many wires? A. Some of the Standard and some of Roebling's.

Q. Do you know what is paid for any of them? A. No; I cannot tell.

Q. The information you can give us, without going any more into detail is not as to how much is paid for any particular item or not how much any particular expense is, but simply
848 the record given you by your bookkeeper, and which you believe to be correct? A. Yes; it is information that comes to me in my official capacity.

Q. Were the statements which you have been reading here this morning prepared for any particular purpose? A. They were prepared at my request.

Q. When? A. One of these statements, you will notice, is two months old.

Q. Which statement is that? A. The one showing the condition up to the 1st of November.

Q. You had another statement here, had you not, which brought the information, as estimated, down to the first of the year? A. The first of the year; yes.

Q. Have you any objection to my seeing that? A. That is the statement that has been incorporated. That is the statement you have got.

Q. When was that statement made? You say it was made at your request. A. Three or four days ago.

Q. Why did you make it? A. I am getting statements right along. I am anxious to see how the thing is working.

Q. Was it made for the purpose of enabling you to
849 give your testimony in this case? A. No, sir.

Q. Have you not been in communication with Mr. Birney in reference to taking your testimony here? A. Mr. Birney wired me that he would like to have my testimony. I wired back that I would not like to give any testimony. Then Mr. Birney came on here and came to see me.

Mr. BIRNEY: That was yesterday.

A. Yes, sir; yesterday. I never saw Mr. Birney until yesterday. These statements had been prepared before, and without any idea of this testimony.

By Mr. WORTHINGTON:

Q. Have you, as president, been in the habit of making annual reports to the board of directors of the financial affairs of the company? A. Our company is not very old; it is only about a year and a half since we began giving service. We could not have made many annual reports.

Q. Have you made any? A. No, sir.

Q. Are there any other persons than the bookkeeper and his assistants and those whom you have mentioned to whom your

company pays annual salaries? A. I think the salaries are nearly all paid on what you call a monthly basis.

Q. Do you know of any other subordinate who receives an annual compensation than those you have mentioned? A. No.

Q. What wages do you pay to your operators? A. I think we average about $5 per week.

850 Q. Are they men or women? A. Women. Of course we have some two or three men up there.

Q. How many operators have you in your general office now in Detroit? A. I think there are about 125 in the service, taking the twenty-four hours through.

Q. How many operators' positions have you at your switchboard in your main office? A. The switchboard is divided into seventy-five for each operator, and there is room for eighty operators on the board.

Q. I understand you to say that each operator is expected to take care of seventy-five subscribers? A. Yes.

Q. And that is what she does? A. That was the intention, yes.

Q. Is that what she does as a matter of fact? A. I don't think they do.

Q. Why? A. Our plan, for Detroit, has been to give good service, and we have hired more girls than the positions required. That was simply so they would not be overworked, because they were new girls, and we had to break them in. We are gradually increasing the work on the girls. They are handling more telephones. As a matter of fact, I think the girls have not handled on an average more than fifty-five or sixty subscribers.

Q. How many subscribers did you have a year ago?

851 A. I gave that testimony.

Q. I will ask you to repeat it; how many subscribers you had. A. As near as I remember we had 4,300 a year ago.

Q. How many operators did you have then? A. I can't tell you that. I can only give you this information in a general way.

Q. How many calls per day do your operators take care of in the busy time of the day? A. I have had several reports: From Mr. Ahern's last report to me, that he was averaging about 50,000 calls a day on our main switchboard, I presume we have sixty operators on the main board, outside of the toll lines. There are four or five positions for toll operators.

Q. Do you know what wages were paid per day to the laborers who laid your conduits? A. No, sir.

Mr. BIRNEY: I will give you all that. I will go into all those details with Mr. Ahern.

By Mr. WORTHINGTON:

Q. I perceive by the information which has been given here you figure out a net profit for the year of over $32,000, but you include in that the sum of over $19,000 which is uncollected? A. Yes.

Q. What is represented by the $19,000 which is uncollected which you count as money in hand? A. No; we don't count it as money in hand. We wish we had it in hand.

852 Q. Why do you not get it in hand? A. We are getting it in hand.

Q. How? A. Collecting it.

Q. How rapidly? A. I presume our arrearages average $19,000. At the end of any quarter I presume our arrearages are $19,000.

Q. Do you know how that $19,000 is made up; how much has been due for a year and how much for less than a year? A. There is very little of it that has been due for longer than one quarter.

Q. How much? A. We have a way of charging off anything that gets very old.

Q. Can you say of your own knowledge that you have not included in this $19,000 accounts against subscribers which are a year old? A. I don't think there is any.

Q. How many are there which are nine months old? A. I don't think there is any.

Q. How many have you which are six months old? A. Let me put that in a different way. I think I can give you the information which you want. I will say that probably twenty per cent of that $19,000 is not good.

By Mr. BIRNEY:

Q. The other eighty per cent is good? A. It is good.

By Mr. WORTHINGTON:

Q. Who are the persons who owe that eighty per cent
853 which you have just told Mr. Birney is good? A. Different subscribers.

Q. How many of them do you know; can you tell us? A. I don't know who they are or anything about them.

Q. You do not know who they are but know that they are good? A. I don't say I know they are good. I think they are good. I judge from the experience we have had.

Q. Is there anything upon your books which will show the present cost of the plant of the Detroit Telephone Company? A. Oh, yes.

Q. What is it? A. I cannot give you that information.

Q. You have been giving us a great deal of information here

at second hand. Can you not give us that? A. I could guess at it.

Q. You could only make a guess; nothing better? Very well. A. We have it exactly on our books.

Q. Mr. Holmes, it is very unsatisfactory, as you must perceive to us, to be getting information which is taken from your books, a synopsis of it instead of the details. Is there any objection to Judge Wilson and myself examining those books for the purpose of aiding us in your cross-examination? A. I don't think I would care to have you do that.

Q. Why? A. It is not a matter we are particularly interested in—this whole matter we have no interest in.

854 Q. We are very much interested in it, and you are now giving testimony, which, if the court gives such weight to it as is desired, may, according to our view of it, absolutely ruin our company in Washington. It is therefore important to us that the court should have direct and not second-hand information on the subjects to which you have testified. If you are willing to come here and testify as to what your books show, why is it you are unwilling to have us look at the books in order to see whether they do show what has been reported to you? A. If you will tell me any reason why we should do it, I shall be very glad.

Q. The reason is that you have taken the stand to testify as to what your books show, and which may be very important testimony in our case, and as you have seen fit to bring into this case the contents of your books, I ask you why you are unwilling to have the books themselves examined in order that it may be seen whether the information which has been given you as to what the books show is correct? A. I simply incorporate in my testimony items from reports which I have received in my official capacity.

Q. You do not undertake to testify that what is in these reports, then, is in the books? A. I believe they are in the books; of course.

Q. You have no suspicion that the reports have been doctored, and the books will show a different state of affairs from what the reports show? A. No.

855 Q. What is your objection, then, to our seeing the books, as we have seen the reports? A. I don't think we are under any obligation to do it. I don't think we want outsiders examining our books.

Q. Do you decline to do it unless compelled to do it by the court? A. Yes.

Mr. WORTHINGTON: Counsel for the defendant request the witness and request the counsel for the complainants to produce here or at the office of the Detroit Telephone Company, if

they think it is more convenient, for our examination, the books from which the statements, which have been put in evidence here this morning, purport to have been made.

A. I respectfully decline to accede to that. I have not tried to varnish this thing at all. I have given you very candid information and opinions on this matter.

Mr. WORTHINGTON: My request is to you, too, Mr. Birney.

Mr. BIRNEY: I have absolutely no control over the books of the Detroit Telephone Company.

Mr. WORTHINGTON: I would suggest that your subpoena would produce them here, if you chose to ask for it.

Mr. BIRNEY: So would yours.

WM. L. HOLMES,
By the Examiner, by consent.

Subscribed and sworn to before me, this —— day of ———, 1899.

———— ————,
Examiner in Chancery.

At this point a recess was taken until 2:15 o'clock to Room 1012 Majestic Building, Detroit.

856 Room 1012 Majestic Building, Detroit, Mich.,
2:15 o'clock p. m.

JOSEPH B. WARE, a witness of lawful age, called by and on behalf of the complainant, having been first duly sworn, is examined.

By Mr. BIRNEY:

Q. What is your name and residence? A. Joseph B. Ware, Grand Rapids, Michigan.

Q. How long have you lived there? A. Twenty-six years next May.

Q. Are you connected in any way with a telephone company, and if so, with what one? A. I am at present secretary of the Citizens' Telephone Company. I was its manager for three years.

Q. Up to what time were you its manager? A. Up until last September.

Q. How long has that company been in operation? A. It has been giving service two years and a half.

Q. It commenced when? A. July 1st, 1896.

Q. Is that a stock company? A. Yes.

Q. What is the amount of its capital stock? A. $200,000.

Q. How extensive is the system? A. We had on January 1st 2,525 telephones in operation.

Q. Can you tell about how many you had a year pre-
857 vious to that? A. Yes; I can give you the figures. In each of our directories we print an announcement as to the number of subscribers, and the list I have here from the date of the beginning of service up to November 1st for each directory.

Q. What do you mean by each directory? A. The first directory we issued we only had four hundred telephones in operation. Each time I issue a directory I state the number of telephones in operation, the number of names in the book, the number of State line points, and the total number of telephones we reach over our system—a little summary that you find there.

Q. Refreshing your memory from that summary, will you please state how many telephones you had in operation on the 1st of January, 1897? A. We had 1,776 telephones in operation on January 1st, 1897.

Q. And on January 1st, 1898, how many? A. I cannot give you the exact numbers of that, because our book was issued November 20th and on April 22nd. I can approximate it.

Q. Give it on those dates. They will do as well. A. On October 20th, 1897, there were 2,074; on April 22d, 1898, there were 2,326. That would make an average of 2,200 on January 1st, 1898.

Q. What were your duties as manager, Mr. Ware? A. I purchased all the materials for construction and repairs. I was the acting treasurer, so that I signed the checks and paid for all material. I engaged the foremen and superintend-
858 ents and chief operators, and all help was hired nominally under my direction. I was the one in charge.

Q. What are your duties as secretary? A. I have charge more particularly of the office work at the present time, Mr. Boyce taking charge of the purchasing of material and the construction and operation of the plant.

Q. By the office work what do you mean? A. I have charge of the paying of bills, the collection of rentals, the making of contracts, and general business matters which do not come directly under Mr. Boyce's hands as the active manager of construction and operation of the exchange.

Q. Then you deal with all the finances of the corporation? A. Yes, sir.

Q. Will you please state what was the plan adopted and followed by your company in financing it?

Mr. WORTHINGTON: At this point it is understood that my objection to testimony in other cities applies to all this testimony.

Mr. BIRNEY: Yes.

A. Will you explain what you have in mind; what you mean?

Q. Did your company issue any bonds? A. No, sir; we organized the company with the idea of obtaining from our fellow citizens, the business men, the money to build a plant for their use. The stock was offered for sale at par. None was sold at a discount and no one received stock for promoting the company. No bonds have ever been issued, and the capital stock represents the actual money which was paid in.

859

Q. You have said the capital stock of the company is $200,000. How much has been issued? A. At the end of our fiscal year, July 1st, 1898, we had $129,000 plus. I forget the exact number of dollars. I have not the figures with me; but it was $129,000 and some dollars actual stock issued. I would like to add this sentence: We placed this stock among as many of our citizens as we could, so that we had 268 stockholders last July. We have about 300 at present.

Q. What has been the actual cost of the construction of your plant? A. At the present time?

Q. If you have made up any statement of recent date, you can speak from that and give the date. A. The actual cost of our plant up to January 1st, 1899, was $169,000.

Q. Is any of that plant underground? A. No, sir.

Q. The system is then the aerial system? A. Entirely aerial. We have perhaps fifty-five thousand feet of fifty-pair cable in connection with our construction.

Q. Which is underground? A. No; aerial.

Q. What size cables do you employ? A. We use fifty-pair as a rule.

860

Of whom do you buy your cables? A. Principally of the Standard Underground Cable Company, of Pittsburg.

Q. What system have you adopted so far as your purchases are concerned? Where do you buy? A. I made it a point of buying at the place where I could find the best material at the most reasonable price, cash. We paid only in cash.

Q. Have you continued that plan? A. Yes, sir.

Q. Of what quality has been the material that was brought and put in your plant? A. The best we could find for our uses, according to our judgment. In other words, I bought no material because it happened to be a little cheaper than some other. I made a point to buy the best cross arms, the best poles, and the best material generally other than the wire. Our wire, I find now, was not the best we could have purchased. We purchased quite a little steel wire, but other than the wire all our material has been first class.

Q. And you supposed that to be first-class at the time you

bought it? A. I knew there was a better quality, but we were short of funds, and I thought the investment was a good one at the time, although I regret now we did not buy the extra quality, being all iron instead of part steel.

Mr. WORTHINGTON: You say it is all iron?

A. I wish it were all iron. We used considerable steel wire, and should have used all iron wire for the outlying districts; but the cable is the best cable that is manufactured; that
861 is, that can be ascertained at the present time.

By Mr. BIRNEY:

Q. And your poles are the best? A. They are second to none in the country.

Q. What rates do you charge your subscribers? A. We are charging the same rates we started with. Our franchise runs for thirty years, and limits the rate to $36 within one mile of our exchange and $24 for anywhere in the city for residences. Before beginning our construction, after an investigation, we decided that we could do business on the basis of $30 and $20, and we made our contracts with our subscribers on the basis of $30 and $20, $30 for business purposes and $20 for residences, on the three-year term. As I stated, the residence rates are flat rates anywhere within the city limits. The business rates are within the mile limit, as I stated. Outside of the mile we receive $2 for each additional quarter, so that two miles from our exchange, for business purposes, the rate is $38. Nearly all of our contracts are for a three-year period. We have less than $50 for one-year terms.

Q. At the time you started in business there was there another company in operation in the city of Grand Rapids? A. Yes, sir.

Q. What was its name and under what patents did it operate? A. The Michigan Telephone Company, being the Bell Company.

862 Q. Licensee, you mean, of the American Bell Telephone Company? A. Yes; meaning the licensee of the American Bell Telephone Company. It had been in operation perhaps fifteen years.

Q. What rates was it charging to subscribers? A. Previous to the time when our franchise was granted the Bell Company had charged $50 per year for business telephones in the downtown districts, and $40 per year for residences within a so-called reasonable distance from the exchange. In the suburbs the rates were as high as $120, ofttimes two on a line. At the time we secured our franchise the Bell people reduced their rate to $48 for business purposes and $36 for residences. The

April preceding the July that we began our service they again reduced their rates one-half, making business rates anywhere within the city of Grand Rapids $24 and residences $18; so that parties in the outskirts of the city, two miles and a half out, who had been on party lines, at $100 apiece, were offered independent telephones at $24 each. The following November, five months after we began service, the Bell Company adopted the policy of free telephones for residences anywhere within the city, and on January 1st following, being January 1st, 1897, they delivered receipted bills to all residence telephone users, said bills being made out at regular rates, and a rebate equal to the amount of the telephone being indicated, and the bills marked "paid" in the usual way, the local manager stating they were not giving free service, but a rebated service. I
863 did not know whether you were on to the scheme or not. There is a distinction there that is quite manifest in this State. This free residence service was continued until last July, when the Bell Company put out bills for residence 'phones for the month of July at $1 each. Those who refused to pay the bills had their telephone service continued just the same. On November 1st all who refused to pay the bills were notified that their telephones would be removed and a number of free telephones have been removed, although at the present time we understand and believe—

Mr. WORTHINGTON: I object to the witness testifying to his understanding and belief.

A. Their present rate is $12 a year for residences and $24 per year for offices, although this morning's papers announce a special one-way service of $12 a year for business telephones and $6 per year for residence 'phones.

Q. Then your rates, as I understand you, have been consistently $30 for business houses and $20 for residences, except outside the mile limit, of which you have spoken? A. Yes, sir.

Q. They are modified in the way you have explained? A. Yes, sir; and we have not changed our rates since we have started. Those rates are for independent wires.

Q. That is, one on a wire? A. One telephone on a wire, all business telephones, metallic circuits.

Q. What kind of instruments do you use? A. We use
864 the granular carbon transmitter known as Hunning's transmitter. It is what is called the English Hunning's transmitter. Mr. Boyce had perhaps better explain that to you, but it is practically a long distance instrument.

Q. Does it give efficient service? A. Yes, sir; beyond question.

Q. How does it compare in efficiency with the long distance telephone used by the Bell licensee? A. We claim it is equal,

and it is generally considered so in Grand Rapids.

Q. Is that your own opinion? A. It is, without question.

Q. What has been the financial result of your rates? Have you paid expenses of operating and maintaining your plant, and if you have paid any more than that, please state it. A. We have paid expenses every quarter since we began service. For one year and a half we have been paying two per cent quarterly dividends in cash.

Q. On what? A. Upon the actual stock issued at the end of the quarter.

Q. That is upon all outstanding capital stock of the company? A. Yes, sir; upon all outstanding capital stock of the company at the time of the passing of the dividends.

Q. Have you earned those dividends as well as the ex-
865 penses? A. Yes, sir; and a surplus besides in a reasonable way.

Q. You have laid up a surplus in addition? A. I have no objection to giving in round numbers the actual figures regarding those years' service, if you desire.

Q. My friend on the other side will probably desire it. Can you state, Mr. Ware, what was the cost of operating and maintaining your telephones during any particular period, say during the year 1898? A. We of course know the gross expense for the year, and the only difficulty in ascertaining the average cost per telephone is that we are a growing company, and the telephones increased four hundred during the year ending June 30th last. Averaging those four hundred and casting a balance made it $18 per telephone. We called it $18 per telephone. Some figure it a trifle less and some figure it a few cents more, but it is approximately $18 per telephone. The expense for the year was $37,000, and we had approximately $2,200 on the average during the year, so that you can figure it yourself—labor and taxes and all expense, insurance and every item, supervision and all.

Q. That includes all expense, but does not, as I take it, include the dividends on the stock? A. Oh, no; I do not consider the dividends a part of operating expenses.

Q. What taxes did you pay in that year? You say they entered into your item of expense? A. I can tell you within a very few dollars, if you will wait half a minute. I think
866 it was $1,860. It was within $50 of that amount.

Q. Do you know the valuation of your plant for taxation? A. That is why I cannot give an exact figure. It was, I think, $62,000 or $63,000. The rate was three per cent that year, and I think it was $63,000. This year the assessed valuation is $115,000 and the rate is 2.8.

Q. Are you familiar with the rates charged for telephone

service in other parts of the State of Michigan, notably in your own locality, the western part of the State? A. Yes, sir; in general.

Q. Will you state them, please? A. The Independent Company in Muskegon, Kalamazoo and Lansing have been charging $24 for business telephones and $18 for residence telephones, those, as a rule, being flat rates anywhere within the State. In smaller towns, such as Holland, the rates are $12 and $18 as a rule—Holland, Hastings and cities of that size. In smaller places, where their exchange will run from twenty to fifty telephones, the rate is usually $12 per telephone for either business or residence places.

Q. In cities using, say 300 telephones, what is the rate, and what cities are there of that type? A. Muskegon has 478 telephones, the rates being $18 and $24. Kalamazoo has about 700 telephones at the same rates. Lansing has about 700 telephones at the same rates. Holland has 171 telephones, at the $12 and $18 rate. Benton Harbor has about 400 telephones, if I remember rightly, and the rates are $18 and $24. That is in general a fair indication of the rates in our section.

867 Howard City, with 58 telephones, has $12 rates. Cedar Springs the same rates, with 23 telephones; and the strange part of it is that at those rates there is a small profit, because there is no expense attached to the maintenance scarcely. The operation is done by a clerk in an office, a drug store usually, and the commission pays for the operation of the exchange—a commission of say 25 per cent for making the connections and the collections; so that the cost of maintenance and the commission covers practically the entire cost of the exchange, and you can see at once that there is quite a reasonable profit, and it increases the toll bills.

Q. As an actual fact, it has worked out in that way? A. Yes; to the entire satisfaction of the individuals and the company.

Q. I think I neglected to ask you this: How large is the population of the city of Grand Rapids? A. It is claimed to be a little over 100,000. I think we will all concede that it is a good plump 90,000, and I consider that the average man on the street would say that we have got 100,000 population.

Mr. WORTHINGTON: Tell what the census is, if you know?

A. 64,000.

By Mr. BIRNEY:

Q. In 1890? A. Yes, sir. Grand Rapids has doubled each ten years in population since 1870. It was 16,000 in 1870, 32,000 in 1880 and 64,000 in 1890; but we enlarged the city lim-

its in 1891, or the Legislature did, and took in 10,000
868 population at that time, which made it 75,000 in 1891; so that there is no question but that we have a good safe 90,000 to-day.

Q. What is the character of the city, so far as business is concerned? Does it do a large business or is it a residence city? A. Grand Rapids is the metropolis of western Michigan, as to wholesale and jobbing houses. The entire north country purchases supplies in our city. We have very large furniture factories, the largest carpet sweeper factory in the world, and various other manufacturing institutions, so that our city is claimed by many to be perhaps as active as any city of its size in the country. Mr. Blaine said it was the largest city for its size he ever was in, and we often repeat the remark.

Q. What style of switchboard have you in your exchange? A. We have what is known as the transfer or trunking system of switchboard.

Q. In the use of that board how many subscribers does one of your operators care for? A. We have two answering operators and one trunk operator for each 130 subscribers up to 1,500. Above that we have three operators for each 200 subscribers, each answering operator answering 75 subscribers.

Q. Are you acquainted with the multiple board? A. Not from actual experience; only from information and investigation.

Q. From your information and investigation of that board have you calculated how many subscribers your operators, with their present degree of training in the business, could care for on the multiple board?

869 Mr. WORTHINGTON: I object to that question because it is not shown that Mr. Ware is qualified to testify as an expert on that subject.

A. As an expert; no, sir. Only from investigation. We have investigated the matter, but I am not an expert on that question at all.

By Mr. BIRNEY:

Q. Answer my question from your investigation. A. We know a multiple board can be operated with less help than a trunking board, and have been investigating the matter somewhat. I am of opinion that with a multiple board one operator would handle about 120 telephones, the average now being 50 per operator, three operators for 150.

Q. It is claimed, Mr. Ware, that with an increase in subscribers there is necessarily a decrease in the number of subscribers for whom one operator can care. Will you please

state what has been your experience upon that subject? State it in full, if you please. A. We have had two switchboards. Our first board was made up of 100 drops per section. Inasmuch as there was no independent company in the United States that had a larger number than 700 in an exchange previous to our organization, I could not tell how many subscribers one operator could handle in our city. We found that on the busy sections, the first thousand numbers, an operator could not handle satisfactorily 100 subscribers. We had a new switchboard made, in which 75 numbers were placed on each section and 1,800 numbers installed. As soon as the operators began to work the new board, we found that above the
1,500 number the operators were not sufficiently busy.
870 I had the 300 higher numbers removed and the sections made into 100 numbers to a board, and all the remaining sections have been 100 numbers to each section. The operators upon the higher numbered boards are not busy, or, at least, not crowded with work, and we are confident and ever will be that the operators upon the lower sections, having the 75 numbers each, are able to handle the business, but are making fifty per cent more connections each per day than the average upon the upper boards in a general way. Of course the jobbing houses were the first users of telephones, and so the lower the numbers the busier the numbers, as a general rule, the first 700 being our busiest telephones by far.

Q. Those telephones are in the business part of the city? A. In the leading business houses and factories of the city.

Q. And your higher numbers extend to what class of customers? A. To the smaller dealers and residences; those who were unable to afford telephones at the old rates and are now using our telephones because of the reduced rate, and they are, of course, the smaller dealers and the residences largely.

Q. What do you say as to the increase or decrease in the number of subscribers for whom each operator can care, with the increase of your subscribers beyond the business part of the
city? A. Each additional section, I think I can safely
871 say, grows a little lighter in the volume of work. That is a new way of putting it, and is just my general opinion, based upon the experience we have had. I do not know whether they are Mr. Boyce's views or not, but I think that is correct, that the sections are getting a trifle lighter as we advance into the higher numbers.

Q. How does that difference affect the average of the work on the entire system? Does it increase it or decrease it? A. There are so many conditions that enter into the problem of the average that it is difficult to make definite, positive statements. Our average number of calls at the present time is ten per tele-

phones, making 25,000 calls per day, as nearly as we can estimate the figures. Business in Grand Rapids in the past 18 months has increased with the improved times, so that there has been no decrease, or a decrease so slight as to be hardly perceptible in the average number of calls, although we have put on additional telephones. Our experience during the three years and a half we have been in the service is such that I believe that with the increased number of telephones the average would be less, because the busy telephones have been apparently placed in service, and this change in business conditions has been the reason for the holding up of the average as high as it is at the present time.

Q. What are the wages paid in your company to your operators? A. Our day operators receive from $15 to $23 per month, and the rates are fixed according to the volume of business per section. Our relief operators receive $12 per month for
872 five hours per day work. Our day girls work nine hours.

Q. You employ women? A. Our operators are all girls. Our chief operator gets $36 per month, and our superintendent of the operating room gets $1,000 per year.

Q. What other officers are in the employ of your company? A. The manager and outside superintendent and the ordinary inspectors and trouble men and line men. Our first president, Mr. E. B. Fisher, devoted about 18 months of his time to the soliciting of stock and getting contracts and general information for the citizens, and was under salary during that period; but since that time, which was July of 1897, no officers of the company have received a salary except myself.

Q. What was Mr. Fisher's salary? A. $1,800 per year.

Q. What was and is your salary? A. My salary was $1,800 per year last year. It is now $2,000.

Q. Mr. Boyce is now in charge of the construction work? A. Mr. Boyce has entire charge of construction, operation and maintenance, the hiring of all the help.

Q. What is his salary? A. $1,800.

873 Cross-examination.

By Mr. WORTHINGTON:

Q. Do you know how many subscribers the company in Grand Rapids, which is a licensee of the Bell Company, has at present? A. Yes, sir; on December 1st, 1898, the Bell Company issued the first directory that it had issued in the year, so that we had no opportunity of making a comparison until that time for twelve months. Our directory was issued on November 1st preceding, so that, adding the telephones after compiling the Bell directory, by adding our growth for November, the actual number of telephones that had been put into service,

we were able to make a comparison which resulted as follows: The Citizens' Company had 1,673 office telephones and 835 residence telephones, making a total of 2,508. The Bell Company had 574 business telephones and 698 residence telephones, a total of 1,272; an excess of 1,099 office telephones and 130 residence telephones, or a total of 1,236 more Citizens' telephones than Bell telephones on December 1st, according to their own directory.

Q. How many subscribers of your company were also subscribers of the Bell Company; that is, how many had to have and pay for two telephones? A. There were about 88 business telephones upon the Bell list which are not found upon our list, about October 1st.

Q. How many residence telephones are there on their list, but not on yours? A. I do not remember. We com-
874 puted the business telephones, and I will say this in a general way, that I would think that seventy per cent of the Bell residences did not use our telephones, perhaps seventy-five per cent. That was the result of the canvass of free residence telephones during the preceding twenty months.

Q. You have said the plant of your company cost, to January 1st, 1899, $169,000. A. Yes, sir.

Q. Are you able to give us now the items which go to make up that aggregate? A. No; I cannot, for this reason: As I have stated, I have had entire charge up until September of the purchases and the general supervision, and have had but one competent bookkeeper to look after the details. We have charged to construction all material as it has been purchased, so that I cannot tell you what our wire has cost and what our poles have cost, and the telephones independently, without computing it a little. I know in a general way, but would want to make some calculations before I could answer your question by items, because we did not keep the items separate.

Q. Can you tell me how many poles you have constructed in that time? A. About 2,600 in the city of Grand Rapids.

Q. How much have they cost, including the cross-arms and other necessary appurtenances, except, of course, the wires? A. Our poles cost us about $3.50 apiece, as I remember the figures.

875 Q. Does that mean put up complete, with cross-arms and all other appurtenances? A. No, sir; those are the bare poles I am speaking of. Twice each month we pay off, and the labor which was used for constructing was charged to the construction account. As we progress in our work, we were behind, as independent companies usually are, the date we expected to commence service, and we were putting up poles, putting on cross-arms and stringing our wire, and putting in tele-

phones all at one time; so I charged the pay roll up to the time we began service, right up to construction.

Q. Could you not tell us how much was spent on poles and how much on wires and how much on inside work and so on? A. No, sir; I cannot tell you. We have not systematized our bookkeeping as we wish we had in the past, but I can give you those items.

Q. Was $3.50 the price paid for each pole, or was that the average? A. I mean the average price would not exceed $3.50.

Q. What was the minimum and maximum for your poles? A. We only purchased four 70 foot poles, and I purchased them in connection with about 1,600 others of shorter lengths. We purchased our poles at the beginning of the fall, in September and October, at a very low price; so that my 70-foot poles and 65-foot poles cost $10, which, we recognize, is a very low price. Our thiry-foot poles cost us not to exceed $1.50.

Q. I wish you would give approximately the number of poles of different lengths that you have? A. I can tell you
876 where you can get the figures if you wish them. That matter is on file at the auditor-general's office in Lansing for last July. We have to make a statement for July 1st of each year, and that statement shows the number of miles of wire and the number of poles. I could have just as well brought a copy with me, but I don't remember those figures. I have not seen them for quite a long time. I can have a copy made and sent to you if that will answer your purpose. In our sworn statement we have to state the length of each pole and the cost of each length.

Q. How many such statements have you made or has your company made? A. We have made two; July of this last year and the year preceding.

Q. Is that a requirement of the State law? A. Yes, sir.

Q. What information have you given in those statements besides the number of poles and the length of them? A. According to the law, we have to make a sworn statement as to the cost of all material. There is a special board made up of the State Treasurer and the Auditor-General and the Land Commissioner, which fixes what the law calls a cash valuation on property, and they take the average rate of taxes paid in the State as shown by the Auditor-General's office, and we are assessed at that rate.

Q. This return is one that you make for the purpose of taxation? A. Yes, sir, and is a sworn statement as to the cost of material.

877 Q. Is that made by you yourself? A. Yes, sir; both these statements were made by me.

Q. You know of your own knowledge that they are accurate?

A. Yes, sir; they are actually correct as to the cost of material. We have not put in those statements any cost of labor. The board had a peculiar system of its own in estimating the cost of labor, and we did not put that in.

Q. What board do you mean? A. I mean this special State board has a system of its own in estimating cost of construction.

It is here agreed by and between counsel that the counsel for the complainants shall obtain and file with the examiner hereafter a duly certified copy of each of the statements just referred to by the witness, and that they be filed with his testimony. (See p. 969.)

By Mr. WORTHINGTON:

Q. The statements to which you referred show only what you paid for material, not what you paid for labor? A. No, sir.

Q. As a matter of fact, what did you pay for your labor that you employed in your construction? A. I never have had occasion to figure up to see what our labor cost us, and I could not answer your question.

Q. What wages did you pay the men who were employed?
A. We paid linemen $2.25 per day and ground men and
878 common laborers $1.25 per day. Of course our foreman received more. Our outside superintendent is receiving $75 per month.

Q. What different kinds of wire have you strung upon these poles? A. Our wire for outside construction is almost entirely iron and steel. There is very little copper wire. Of course our cables are the usual aerial cable, with copper conductors. The wire for the greater part was steel wire.

Q. I wish you would give me such a description of it as would enable those who are experienced in the business to identify it. A. The greater part is No. 14 steel wire.

Q. Of what make? A. One carload from Washburn & Moyer, and the balance made by Roebling, of Trenton, N. J., excepting about three carloads from the Consolidated Steel and Wire Company, of Pittsburgh.

Q. How much did you pay for that No. 14 steel wire? A. It ranged from two to three cents until recently. It is now a little higher. Mr. Boyce can give you the present price.

Q. From two to three cents per pound? A. Yes, sir; per pound. We have a little copper wire, No. 14, and some No. 10 in our aerial construction which cost about 14 cents a pound on the average.

Q. Where did you use that copper wire; under what circumstances? A. Our growth has been so rapid that we were
879 not able to construct full metallic circuits, two wires to each telephone, as we originally planned to do; and as

the circumstances required we have split up those metallic circuits into what are known as common returns, using a copper wire for the returns, and we have gotten up quite a little copper wire in that way; so that our residences are all copper returns, as a rule, and our business houses are on the full metallic.

Q. How many miles of wire have you now in actual use? A. That report will show, but in a general way we have, I think it is, 2,200 miles of the aerial steel wire, and a comparatively small amount of copper. I would not want to repeat how much, because I do not remember. A small amount.

Q. What kind of wire have you used besides the No. 14 steel wire you have told us about? A. For outside construction?

Q. Yes; I am speaking of that. A. That is all we have used except in very exceptional circumstances.

Q. As to your inside work, will this statement also show the cost of material in that? A. In general; yes, sir. We have aimed to include in the statement the material used in our construction, inside and outside.

Q. Does that include the equipment, the cost of installation of your subscribers' telephones? A. No; not the cost of installation.

Q. Why was that not included? A. There was no
880 labor included in the report. It was not required. It is only the cost of material. It shows the cost of telephones at $9.90 each, and our switchboards cost us about $3.50 per drop. It cost $3.25 according to contract, and we made a slight change that involved a thousand dollars more, which we spread over the entire amount, making about $3.50.

Q. That is your present switchboard? A. Yes, sir.

Q. Where was that built and by whom? A. The American Electric Telephone Company, of Chicago.

Q. And in Chicago? A. In Chicago; yes, sir.

Q. When did you get that switchboard? A. About a year and a half ago. I do not remember exactly. We replaced the first board a little at a time. This new board was sent over in sections, and we were to get everything ready and replace three sections at a time, so that I do not really remember. Perhaps I will be able to fix it in this way. May 10th was the date of the Berliner decision, and that was the time we had our 1,000 numbers put in, that morning, May 10th, 1897. It was the date of the Berliner decision.

Q. You have described your switchboard as being the transfer and trunking system? A. Yes, sir.

Q. Will you please explain the operation of the switchboard so that we may know wherein it differs from a multiple board. We know what a multiple board is. A. The operator
881 can reach any subscriber in a system. In a transfer board she can only reach herself about 150 subscribers,

75 on her section and 75 on the section adjoining her; that is as far as she can reach. The sections are 22 inches wide. Between these two answering subscribers sits a trunk operator, who will receive the calls by means of extension boards or wires from the operators at other ends of the room, who cannot reach this 150 numbers that she is the auxiliary for; so that when No. 1,500 telephone rings his telephone and asks for No. 5 the operators, instead of plugging into the No. 5 subscriber—

Q. As in a multiple board? A. As in a multiple board. Instead of plugging into the No. 5 subscriber's jack she plugs into a jack that has a corresponding number on this trunk operating board, next to the No. 5 subscriber's section. This operator has a drop falling which indicates the only plug that has that transfer call. She picks up her plug and inserts it into the No. 5 jack, and thereby completes the connection.

Q. So that one operator signals to another and that operator makes the connection? A. Yes; it takes two operators to complete a connection on our boards, in 90 odd per cent of the calls.

Q. The system, then, is analagous to that of separate exchanges? A. The same system in general, as your trunking system would be in New York or Chicago. Those are trunk lines. It is the same system in general.

882 Q. Instead of signaling to another operator at another exchange you signal to another operator in the same room? A. Yes.

Q. In other words, it is about the same? A. He (indicating Mr. Boyce) can explain it technically. In common language, that is what we do.

Q. And any delays or trouble or likelihood of mistakes which results in having to communicate through a sub-exchange it would be liable to also? A. Yes; very largely.

Q. You have spoken about 70,000 feet of fifty pair cable in use. In what connection is that used? A. That is aerial cable that leaves our exchange and goes out until we can strike a lead. Of course the main lead coming down to the exchange will only carry a limited number of wires, so we have to carry our cables up until we strike a branch street or a cross street that has aerial construction on it.

Q. What is the size and description of the cable wire which you use in that fifty pair cable? A. 19, as a rule.

Q. Of whose make? A. The Standard Underground principally. We have a little Roebling cable.

Q. Do you know what that costs? A. Yes; our fifty pair cable costs us about 23 cents on the average, within a fraction of a cent.

Q. Do you know what your present switchboard cost?

883 A. Yes, sir.

Q. How much? A. It cost us $3.25 per drop, and $1,000 extra for a change that was made. That is what we paid the manufacturer, about $3.50 per drop.

Q. How many drops? A. There are 2,500 drops.

Q. Then in round numbers your switchboard cost you in the neighborhood of $10,000? A. Yes; $10,000; that is, on board the cars in Chicago.

Q. Before I forget it, what kind of poles do you use? A. Cedar and a very good class, indeed.

By Mr. BIRNEY:

Q. Does the statement of cost of the switchboard you have just given include the wiring and setting up? A. No, sir.

By Mr. WORTHINGTON:

Q. What did that cost? A. I cannot tell you, because, as I say, the labor of our construction all went in each pay day to the construction account, and we have been too busy to go through and work it out and ascertain it. It is of no value to us except as general information, and for a case of this kind, and I have not had the opportunity, or time, rather, to ascertain. I cannot answer your question, unfortunately. I am sorry.

Q. Have you sold any stock in the last year? A. Oh, yes, sir.

Q. How much? A. About $50,000 worth in the year.

884 Q. Have you received the $50,000? A. Yes, sir.

Q. What was done with that money? A. That is what we have used in our construction. We had a growth of 400 in the year ending June 30th, and of course it would be impossible to take care of that growth except with additional capital. On July 1st we had 2,381 telephones in service. To-day we have 2,525. That shows a net growth in the past six months, and it has been necessary to get additional capital.

Q. Have you kept that $50,000 or about $50,000 which you received in a separate account, or has it just gone into the common fund and have you checked it out with money received from other sources? A. We have but one bank account.

Q. That is the same fund, of course, from which you have checked out the dividends you have paid? A. Yes, sir.

Q. Can you state just what you have paid for new construction in the past year, and how it has been expended? A. No; I cannot. I could if I had anticipated the question. I could have looked it up and told you exactly from the books. I cannot answer your question without reference to the books.

Q. Can you give us approximately, or otherwise, the expense incurred for the installation of these four hundred new subscribers whom you obtained during the year? A. I can

885 state one fact which will approximate what you are after. Our exchange plant has cost us right along at different periods—we have kept track to know the average expense per telephone—from $65 to $67 and a fraction—it is about $66. I had not footed it up for three months, but I think if you will divide the cost of our plant you will find it is pretty close to that. It is about $66 or $67, the average expense.

Q. That included the central office and everything? A. Everything, labor and material of all kinds and character whatever, that has gone into the plant.

Q. In the last year have you added anything to your central office plant? A. Only switchboard sections.

Q. How much did that cost? A. Our sections have 100 numbers per section, and they cost us $3.50 per drop.

Q. How many sections have you added during the year? A. During the past year?

Q. Yes. A. About four sections. We have had about 400 growth. It was about 400 the first of January and 200 since.

Q. Then it is about $1,400? A. That is for the board proper, without any labor or work upon it, just the drops and jacks and sections—cabinet work.

Q. What did that labor or work cost you; can you tell us? A. No; Mr. Boyce can approximate that better than I can.

886 Q. Can you tell me what is the average distance from your exchange of your subscribers; first of your business subscribers and then of your residence subscribers? A. We have about 2,500, and, if I remember the figures, we have about 2,600 miles of wire. That will show about a mile per subscriber; but our business telephones are metallic and our residence telephones are common return. We never computed it on that basis. That is another way of figuring it, but I should judge we have 2,600 miles of wire, in round figures, with our 2,500 subscribers.

Q. How many of your 2,500 subscribers have double wire? A. My recollection is there was about 48 per cent.

Q. Say about one-half? A. I think about one-half. It will run just about one-half. I think that is correct.

Q. Have you had since your company was started any loss from heavy storms? A. No, sir; we have been fortunate.

Q. The recent blizzard passed over you? A. It did, as far as breaking down any of our construction was concerned. We thought we had a severe time, but when we heard what our neighbors had suffered we were satisfied. We got along very nicely. No poles were broken, which demonstrated our wisdom in putting up first-class material while we were at it.

Q. It has appeared here to-day in evidence that the 887 overhead plant of the Detroit Telephone Company here in Detroit was very seriously damaged by that storm.

Do you mean to say that that shows that their plant is inferior to yours, or might it not be that the storm was more severe here than it was in Grand Rapids? A. The storm was more severe here and in Saginaw than it was in Grand Rapids, and yet the Bell Company in Grand Rapids and Kalamazoo had quite a number of poles destroyed. Their construction, however, was older than ours, and it was natural that they should have more damage than we had.

Q. Why should an old plant fall down more easily than a new one? A. Because their construction was old and ours was new comparatively.

Q. Why is not an old overhead plant as good as a new one? A. The poles are older, in the first place, and, in the second place, the Bell Company have a great many cross-arms in Grand Rapids without any braces. We have no cross-arms without two braces on it. Every corner has been strongly guyed to protect us against damage. We have not hesitated to spend money for the purpose of protecting ourselves in that way. We have used the largest size cross-arms and the strongest guys it was possible to put up in reason.

Q. You tell us that the expenses of your company for the past year, if I am not mistaken, are $37,000? A. For the year ending June 30th last.

888 Q. Can you give me the items of that expenditure in detail? A. No; I cannot now. I can make them up for you if you desire.

Q. Can you approximate at all the items which make up that sum of $37,000? Can you tell me how much of it, for instance, is for maintenance and how much for salaries and wages? A. I will endeavor to recall those figures and give them to you later in the day, if possible. Five months ago I could have given them at once, but it has slipped my memory since the annual meeting, and I did not bring any of those figures along. It did not occur to me you would need them. I will endeavor to recall in a general way those items.

Q. Are they in writing anywhere now? Has any report been made to your board of directors of those things? A. Yes, sir.

Q. Has it been printed? A. No, sir.

Q. Or published in any way? A. No, sir; nothing except the general statement that the expenses were $37,000 and the income $57,000 for the year ending June 30th.

Q. Can you give me the sources from which the $57,000 income was derived? A. In round numbers $56,000 was received from rentals and about $1,200 from our toll commissions. We did not own the State lines or the toll lines, but handled the toll business on a commission, so that in round numbers it was $56,000 and $1,200.

Q. Can you give me any idea at all about how much
889 of your expenses for the past year went for maintenance of the plant? A. Not off-hand. I will try and figure that out for you. I will try and figure that out for you if I can this afternoon.

Q. Do you know enough about how your books are kept to know what items are entered to maintenance and what to construction; where the line is drawn in your bookkeeping? A. Yes, sir.

Q. What is that? A. All labor of installing telephones and inspecting telephones and caring for trouble, the operating of the exchange, all office help and collectors is charged to operating expenses. In addition to that we charge one full crew, consisting of a superintendent and three linemen and a wagon and groundmen, to operating expenses also. In other words, we endeavor to be on the safe side, and charge up to operating expenses everything within reason that we charge to those accounts. We have no expectation of issuing any mortgage bonds or anything of that character, and have desired not to increase our construction except for the actual money expended for material and labor of putting up new toll lines and new cables. The stringing of new wires for individual subscribers is charged to operating expenses.

Q. Have you included in your expenses any allowance for the depreciation of the plant? A. Last year we includ-
890 ed five per cent. We charged off five per cent last year. That was the first year we have included any depreciation. That was included in the estimate I gave you.

Q. You have been asked about a number of smaller towns, and I will inquire about one or two of them for specimens of the whole. A. Yes, sir.

Q. What kind of a telephone plant have they at Muskegon? A. They have a very excellent plant. It is a common return system throughout.

Q. All overhead, I suppose? A. All overhead. There is no underground work and very little cable construction.

Q. In all these towns you have spoken of, it is all overhead? A. Yes, sir; there are no grounded circuits in the State.

Q. You say that in your plant and in that of these other towns the metallic circuit exclusively is used? A. No; the aerial construction.

Q. You said there was no grounded circuit. What do you mean by that? A. The grounded circuit is where they use earth for the return current. That is not used anywhere in the independent exchanges in Western Michigan, as far as I can recall at the present time.

Q. I understood you to say that in your system it was some-

what less than 50 per cent of your subscribers who have
891 return wires? A. What I have in mind is this: There are three kinds of circuit, the full metallic, which is a wire out and a wire back for each subscriber; the common return, which is a wire out and a common wire back for a number of subscribers; and the ground line, which is a wire out going to earth, and back through the earth to the exchange. The old construction on the part of the Bell Company was ground line construction, but as the street cars and electric lights became common the noises from the lines were such that we had to adopt the return system. Until quite recently, I think, in some of the largest cities, and even in portions of Chicago, they have the ground line construction. I do not know what you have in your country, but the independent companies have adopted the general construction which the Bell Companies are using at the present time, which is metallic or the metallic common return. There is no ground line construction in any exchange of any size that I know of in our section of the country.

Q. What proportion of your subscribers have what is called the common return system, as distinguished from the metallic circuit? A. I said about 50 per cent. Our business telephones are the metallic, and residences, being the less important of the two, have common returns, which we are making metallic as rapidly as we can get our construction in proper shape.

Q. I think you have said before your subscribers are on the single wire system. A. No; I said our rates were for
892 one telephone on a line, the rates I have named. We have a limited number of party lines—one telephone on a line. I cannot tell you the number. Mr. Boyce can, but they are limited. Physicians, as a rule, two on one line—their house and their office; and we have a number of extension telephones in an office or in adjoining offices upon the same line; but those are exceptional cases. Nearly all of our telephones are single subscriber's lines, there being probably about 125 party lines, approximately.

Q. The first switchboard which your company had you used how long? A. We began service July 1st, and we had a thousand on the new board in the following May, so that we used parts of it a year.

Q. Then the new board has been in use how long? A. A year and a half, on an average.

Q. What became of the first board? A. It was returned to the manufacturer. We differed in opinion as to whether an operator could care for 100 subscribers. The manufacturer had never made anything but 100 number sections, and he put it in in that way with the contract, that in case it was necessary

to furnish a new board with a less number of subscribers per section he would do so. He took the old board back and furnished us a new board, and we did not pay for the first board. We were at the expense of setting it up and wiring it and taking it out again, but we did not pay for the board itself.

893 Q. Has your company at any time paid any license or other fee for the privilege of using any part of your system? A. We paid $1,000 to have the Beach-Cook transfer system used in connection with our switchboard.

Q. That is all? A. Of that $1,000, I understand half of it was a fee and half of it was the extra expense of making the change in the manufacture of our board. We have paid no other license fee or royalty or anything of that character. We pay no royalties on anything.

Q. Your subscribers, I believe, have no connection with any long distance system except the interstate independent system? A. That is all. We reach about three hundred towns in western Michigan, and within the next thirty days we will reach to northern Indiana, Illinois and Ohio districts. The line is about completed now. They have connected to the eastern section of the State in limited circuits.

Q. Have you since your company began business had any regular system of keeping the count of the number of calls? A. No, sir; except that we have endeavored every five or six months to take account of the calls on some particular day, usually Wednesday, that being an average day of the week, Mondays and Saturdays being much more busy than any other days, but Wednesday being a fairly quiet day.

Q. And how many such counts have you taken? A. I think four.

894 Q. On what days, as nearly as you can tell? A. I don't know that I can indicate that with any degree of accuracy. The first one was taken after we had been in operation, I think, a year, and the other three have been taken during the past year.

Q. Do you remember how many daily calls you had on that Wednesday when you took your first count, about a year after your beginning operation? A. In a general way, I think we had about 19,000, if I remember rightly. It was very close to 19,000 calls the first time.

Q. How long after that was the second one taken? A. Probably three months. It was a comparatively short time. It went up to nearly 21,000 calls.

Q. And the next one? A. There was one taken, I would say, in the latter part of last July or the 1st of August.

Q. That was two years after you started? A. Two years after we started; yes, sir.

Q. How many calls were there then? A. I don't remember the numbers of those, but my general recollection is that there were about 2,000 calls more than the one previous.

Q. About 2,000 more? A. Yes, sir; I think so, if I remember correctly.

Q. When was the next? That would make three. A. There was one taken since Mr. Boyce came, I think it was.

Q. Mr. Boyce indicates a negative. A. Mr. Boyce
895 came in September. I guess the one I said was in the latter part of July or in August was the last one that was taken. We had a little over 24,000. That was taken by our former exchange superintendent, and was the last one taken. I guess probably there were only three.

Q. How many subscribers did you have a year after you began business? A. I can tell you those figures. (Witness examining paper.) That would be about 1,950.

Q. In a year and three months, how many did you have about? A. That would bring it to October 20th, would it not?

Q. Yes. A. That is when I issued the new directory. There was 2,074, and last summer we had about 2,400. We have 2,500 now, and we had 2,381 the 1st of July. That last count was taken between July 1st and September, somewhere along in July or August. We had about 2,400, I think.

Q. Taking these counts, have you kept account of the number of calls by each subscriber, or has it been simply the aggregate number of calls per day? A. The count was taken for the purpose of establishing a price for the operators on each circuit, and that, by the way, establishes the date of taking one of those counts, which was a little later than October. It was in the latter part of November, because we changed the system of paying our operators on January 1st, and fixed a price upon each section, $23 for the highest, $15 for the lowest section,
896 according to the volume of business upon those sections. There has never been a complaint on the part of any of our operators of an injustice done any of them on account of the rates fixed. They are satisfied that the general adjustment is about right.

Q. Then your account shows the number of calls for each board, but not the number for each subscriber? A. No, sir; we did not care what each subscriber called. We merely averaged it. It was pure curiosity. We took the calls for each section.

Q. And the recent acquisitions to your subscribers are mainly residence subscribers, are they, largely? A. Of course there is a large per centage of residences. I haven't counted it up to see whether there were over half residences or not. I should judge there were, perhaps, a trifle over a half.

Q. Were the majority of them business houses? A. Yes, sir; I think it is safe to say we had more business houses than residences to start with in our new subscribers. I doubt if the difference in proportion is very material. The more I think of it, the more I am inclined to think the business is holding up pretty well. I would like to have that question asked of Mr. Boyce, to see what his judgment is.

Q. Your poles are erected, I suppose, almost entirely on the streets of the city? A. Yes, sir; we have comparatively few alleys. We have gone in alleys wherever we could, but there are so few it is safe to say they are all on the streets at the curb lines.

897 Q. What is the maximum distance of your subscribers from the central office? I do not mean each particular subscriber, but, say the 100 who are farthest away from you. A. The farthest 100?

Q. Yes. A. I will say two miles and a half. I guess I had better increase that to three miles.

Q. How far from the exchange are the bulk of your business houses? How do they average? A. I couldn't answer that.

Q. Can you approximate it? A. The mile circuit, of course, from the exchange includes the bulk of our business houses.

Redirect examination.

By Mr. BIRNEY:

Q. How far away is your most extreme distance subscriber? A. We have six subscribers at Granville, a distance of about six miles, and we have three or four on the same pole line back to about the city limits; so there are perhaps about ten on that six mile pole line. Then we go to the westward about four miles. We have seven subscribers on that pole line outside the city.

Q. How far distant are they from your exchange? A. Four miles on the north; we go to Mill Creek, where we have half a dozen subscribers on that line. Mill Creek must be nearly four miles. Then we go on the eastward to Reed's Lake, there we have half a dozen subscribers only, and that is nearly five miles from our exchange. We go out to the County Farm,

898 which is six miles out from the exchange, so that we go a good way to get to a few of our subscribers.

Q. Your answer to Mr. Worthington, I take it, means that outside the circle of three miles, you have at least a hundred subscribers. Is that what you meant? A. No; he meant how far out the 100 would be.

Mr. WORTHINGTON: I meant the average distance of the 100 subscribers who are farthest away. A. I think it would be

three miles. I didn't think of these extreme subscribers at that time hardly. I will have to do a little figuring to average that. I have named about 36 subscribers in the last few minutes, and they will average five miles out. Those are the only ones at that distance. Then by dropping back a couple of miles we get to the suburbs of the city; so I think three miles is a very conservative estimate of the distance. I think it would be fully that for the outside 100.

By Mr. BIRNEY:

Q. Mr. Ware, you have stated that you paid no royalties? A. That is correct.

Q. Do you buy your telephone instruments outright? A. Yes, sir.

Q. What do they cost you? A. $9.90, f. o. b., Chicago.

Q. Have you calculated the cost of the labor of setting up the instrument in the subscriber's station? A. No, sir; we have never kept those items. Mr. Boyce, in general, can answer these questions probably. We never made any com-
899 putation.

Q. In what account do you carry the cost of the telephone instruments, construction or maintenance? A. The original cost?

Q. Yes. A. Construction. By construction I mean the cost of the plant. Plant cost and construction are the same thing. If I used the terms to-day I mean one and the same thing.

Q. You have stated that stock was sold to the amount of about $50,000 during the past year? A. Yes, sir.

Q. Was all of that used in your city system, or did some of it go elsewhere?

Mr. WORTHINGTON: I object to this leading form of interrogatory.

Q. I will change that. How much of it was used in your city system, about which you have been testifying? A. About $28,000 was used in our city plant and about $22,000 in building toll lines.

Q. Then in the testimony you have given you have not included the toll lines in the items of cost and receipts? A. No, sir; I did not understand that there had been any question in regard to toll lines.

Recross-examination.

By Mr. WORTHINGTON:

Q. What do you include in the item "instrument?" You say you pay $9.90 for each instrument. A. The instrument
900 complete, which includes the receiver and the transmit-

ter, the magneto and the two cells of batteries, with the backboard, all that which attached to the wire will enable subscribers to talk.

Q. Have you kept separate accounts of your receipts and expenditures from your toll lines? A. Yes, sir.

Q. That is, I suppose, what is known as a measured service? A. We have no measured service. Measured service applies to people in the city talking to each other—within the city exchange limits. We have no measured service in this State, as far as I am personally acquainted, unless there is some in Detroit.

Q. What are the toll lines? A. The toll lines are the State lines connecting different towns and cities together, for which we get full charges or State line fees.

Q. The statute permits that? A. Oh, yes; it is the same as telegraph fees. If you send a telegram from Detroit to Grand Rapids, you pay a fee for it, the same as if you had telephoned.

Q. Did the statute make that distinction or is that one which the company has made for itself? A. It is one which was established for us by the Bell Company, and we have all followed it. The toll line service is thoroughly distinct; that is, the rental rates I have given you, $20 and $30, entitle the subscriber to the free use of telephones in the exchanges proper, but if a person talks to another party who is outside our ex-
901 change in some other exchange, or in some other town or city, they pay the toll rental.

By Mr. BIRNEY:

Q. It is equivalent to the long distance rates, is it not? A. Yes, sir.

JOSEPH B. WARE,
By the Examiner, by consent.

Subscribed and sworn to before me, this —— day of ———, 1899.

———— ————,
Examiner in Chancery.

902 CHARLES L. BOYCE, a witness of lawful age, called by and on behalf of the complainants, being first duly sworn, is examined.

By Mr. BIRNEY:

Q. State your name and residence, Mr. Boyce? A. Charles L. Boyce; Grand Rapids.

Q. What is your profession? A. I am manager for the Citizens' Telephone Company, of Grand Rapids.

Q. How long have you been in Grand Rapids and in that service? A. I have been there nearly four months.

Q. What has been your connection in the past with telephone companies, and where? A. I started in the telephone business in the last of 1879 in Muskegon, Michigan, as messenger boy and office boy.

Q. With what company? A. With the Michigan Telephone Company. It was then the Telegraph and Telephone Construction Company.

Q. Is that the same company which operates under the Bell license in the State of Michigan? A. Yes, sir.

Q. Having Detroit as one of its stations? A. Yes, sir.

Q. How long did you remain there, and what was your experience afterward? A. I was made manager of the Muskegon Exchange and then promoted to manager of the Grand Rapids Exchange of the Bell Company. That was in 1883.

903 From Grand Rapids I was brought to Detroit and made superintendent of equipment.

Q. How many years did you spend at Grand Rapids as the manager of that station? A. From 1883 until 1890 or 1891.

Q. Then you came to Detroit? A. Yes, sir.

Q. And were here with the Michigan Company? A. Yes, sir.

Q. How long? A. From 1890 or 1891 up until four months ago.

Q. During all that time were you superintendent of equipment of that company? A. No, sir; I left the company here for three months during that time, and I held the position of superintendent of the Fisher Electrical Works of this city.

Q. When was that period? A. That was in 1893.

Q. You returned to the Michigan Telephone Company? A. Yes, sir.

Q. And remained there until four months ago? A. Yes, sir.

Q. As superintendent of equipment? A. No; when I first came back to the company I was chief operator, and later I was made superintendent of equipment.

Q. By chief operator do you mean that you had charge of the operating room of the company? A. The operating room; yes, sir.

904 Q. Have you, in the course of your experience, become acquainted with the methods of construction and the cost of construction of the telephone system, and particularly of equipment? A. I have.

Q. Have you also become familiar with the methods of construction of switchboards and the cost of construction of switchboards? A. Yes, sir.

Q. You are now connected with the Grand Rapids Telephone Company, of which Mr. Ware is secretary? A. Yes, sir.

Q. What type of switchboard is used in Detroit in the

Michigan Telephone Company's Exchange? A. It is known by the Bell Company as the Branch Terminal Board. Some people term it a bridging switchboard.

Q. Do you know whether that is the same type of board which is used in the Washington Exchange, in the District of Columbia? A. It is my impression that it is, because the engineer of the Washington Company wrote me just before the board was installed to get the kind of fixtures that we placed on our boards, which is the branch terminal board here, stating that they had the same board we had.

Mr. WORTHINGTON: I object to this as manifestly hearsay and incompetent.

By Mr. BIRNEY:

905 Q. Has there been any increase or decrease in the cost of the switchboard since 1894? A. Yes, sir; there has.

Q. Which way has it been? A. There has been a decrease in the cost of jacks, drops, operator's outfit, and putting in the entire equipment.

Q. What decrease has there been in the market price of these various items? A. Jacks have been reduced; that is, the multiple jack has been reduced from fifty cents to twenty-five cents. These are the prices that the Michigan Telephone Company have. The answering jacks, which are specially mounted in the branch terminal board at Detroit are fifty cents each, there being no reduction on them. As I recollect it, the drops were reduced from $3.00 to $2.70 each; $2.70 is the present price, I know that. With this reduction in jacks the Western Electric Company, which is the manufacturer of the branch terminal board, has made a charge of $125 for the framework, which, at the old price of fifty cents per jack, was not considered. The frame was thrown in with the equipment.

Q. Have you to-day at my request made up a statement of the present cost of a switchboard of the type in question with a capacity of 2,200 lines? A. I have.

906 Q. Please give it. A. A 2,200-line switchboard complete, with self-restoring drops, 22 operators' positions, eight switchboard frames, cross-connecting board, power plant and the chief operator's supervisory tables, I figure that the exchange can be put in, including the labor of installing, for $24,528.

Q. Does that include the wiring and the setting up? A. Yes, sir.

Q. That includes, then, as I understand you, all the items of cost attending the installation of a switchboard of that type? A. A complete system.

Q. In making your calculations have you used the present market prices? A. Yes, sir; I have.

Q. Have you made a calculation of the cost of a switchboard of that type of 4,000 lines, or in that neighborhood? A. I have not for 4,000, but for 4,400 I have.

Q. Will you please give that calculation? A. Including the same items, the reduced price for the equipment would be $67,895.

Q. That is complete in every respect? A. In every respect.

Q. Has there been any recent improvement in switchboards? A. There has; yes, sir.

Q. What is the type of switchboard which you have in mind as an improvement? A. It is known by the Bell Company as the Relay System No. 3. That is the latest I know of.

907 Q. By what company is that manufactured? A. By the Western Electric Company, of Chicago.

Q. Will you please explain as briefly as you can the difference between that board and the present board, and in what the improvements consist? A. It is the complete system, not only the switchboard, but the subscribers' outfit. The operator has complete supervision over all of the subscriber's movements; that is, when the subscriber takes the telephone from the hook, a lamp will light at the central station. The operator will then answer the call in the usual manner, and transfer the signal from the lamp to the clearing-out signal. This clearing-out signal is individual to the answered subscriber. The called subscriber also has a clearing-out signal which is individual to the called subscriber. With these two signals the operator, without cutting in and using the usual words, "are you done?" or "all through?" can take down the switches. The Western Electric Company's engineer at Chicago told me when we were figuring for a system—

Mr. WORTHINGTON: I object to this as manifestly hearsay and incompetent.

A. (continuing) for a Grand Rapids exchange, that we could figure two thousand calls per operator, which is the benefit derived from having this particular supervision at the central station. The local batteries at the subscriber's station are also discontinued, as a common battery at the central office supplies the required current for calling the central office and for

908 the transmission, and as this common battery is all that is required to signal the office—all the electro-motor force required to signal the office—the magneto generator at the subscriber's station is also discontinued, the original cost of equipment being less than it is with the magneto system or the subscriber's equipment that belonged and worked with the branch terminal switchboard.

Q. Have you seen boards of that kind in operation? A. I have.

Q. Where? A. I have seen it in operation at Cleveland.

Q. In the Bell licensee's office? A. Yes, sir; while I was with the Bell Company I was sent to three different towns, Cleveland, Louisville, Ky., and Indianapolis.

Q. And is such a board in use in each of those places? A. Yes, sir.

Q. What effect has the use of that board upon the number of subscribers' lines for which an operator can care? A. I would prefer to answer that by stating that the operator's capacity is doubled by the supervision. That is, with the branch terminal board 1,000 calls per day is considered about as much as an operator should have, and when we figured on the Grand Rapids system we were told by the Western Electric Company that we could figure on 2,000 calls per day per operator.

Mr. WORTHINGTON: I object to this hearsay evidence.

By Mr. BIRNEY:

909 Q. What decrease in the first cost of the subscriber's equipment is brought about by the new system? A. I have forgotten the exact price, but as I remember it $6.25 by the subscriber's bell and backboard and the condenser; that is also a part of the subscriber's equipment.

Q. Do you mean under this relay system? A. Yes, sir; under the relay system.

Q. What effect, if any, upon the cost of maintaining the subscriber's equipment does this system have? A. It will reduce inspection at least fifty per cent.

Q. Why? Please explain. A. Because the local batteries in the old way have been taken out.

Q. What is it that requires inspection of the subscriber's station? A. In an aerial system, the same as we have at Grand Rapids, the two principal troubles are line troubles and battery troubles.

Q. By battery troubles, what batteries do you mean? A. I mean the batteries at the subscribers' stations.

Q. And under this other system you say the cost of inspection of that battery would be done away with because the battery is abandoned? A. Yes, sir; the one battery at the central office takes care of the entire plant for both calling and operating the transmitters.

Q. Is a board of that type greater or less in first cost than the multiple board known as the terminal branch board?

910 A. It depends entirely upon the size of the exchange. In the Grand Rapids exchange it would cost more. I have not the figures on what a branch terminal board would cost for the same number of lines, which is 1,440.

Q. The Grand Rapids board you have now spoken of is the

board of the Bell Company, is it? A. Yes; the one they are installing there now or are about to install. A common battery board of that kind would cost them $27,000, or about that amount.

Q. That is under the relay system? A. Yes, sir.

Q. What would be the relative cost of boards of 4,000 capacity? A. I think the 4,000 board capacity would cost about the same as the common battery plant, as the power plant, which would be the same in both cases, and that is common to the entire system.

Q. What do you mean by the power plant, so there will be no mistake? A. It is the storage battery plant, motors and generators for charging the storage batteries, switchboards and all the necessary switches to furnish the current for transmission and clearing out.

Q. When you were in charge of the operating room of the Bell Company establishment in Detroit, what was the number of subscribers? A. I think it was between 3,900 and 4,000.

911 Q. Was that at the time your connection with them ceased? A. No, sir; I was superintendent of equipment.

Q. Mr. Boyce, it has been testified that, given a switchboard of 2,250 subscribers, to increase that switchboard to 4,500 subscribers, there would be required an increase of four times the size of the board to accomodate the business. Will you please state what your experience teaches you as to whether that is correct or otherwise. A. Four times the size of the switchboard?

Q. Yes. A. I estimate that it would take eight sections for 2,200 lines, and it would take sixteen sections for 4,400. In one case each section would be equipped with 2,500 jacks, which is the system that is taking care of the 2,200 lines per section. It would be equipped with 4,700 jacks per section for the one taking care of 4,400 lines. I figure in this that one operator can take care of 100 lines in a system of 4,400, the same as he is doing with the 2,200 lines; so the operators' position in both cases is proportionate to the number of lines. In Cincinnati they have one hundred lines to the operator. In Detroit, which has about 4,200 subscribers now, they are working 70 lines to the operator, with average calls per subscriber of about 12.

Q. It has also been testified that with the increase in the number of subscribers, there is an increase of calls per subscriber over the whole system, according to the square of the increase. Is that according to your experience correct

912 or not? A. Not if I understand you correctly; no. You say the square of the increase?

Q. Yes; that is to say that doubling the number of subscribers would produce this result. A. Would square the number of calls?

Q. Qes. A. I don't see how it is possible for anyone to figure it that way. Take my experience in Grand Rapids. I cannot state the year, but the American Bell Telephone Company sent out a circular, a folder. In that folder it said—

Mr. WORTHINGTON: I object to the witness stating the contents of this folder as being incompetent, even if the folder were here.

Q. Have you that folder here? A. No, sir.

Q. State all you remember of it. A. It stated that Grand Rapids, Michigan, had the greatest ratio of telephones to the population of any place in the United States; that Atlanta, Ga., I think I can give the exact words it used, was even better, considering that half of the population was black. We had at that time about 1,500 telephones. The calls, per telephone, in Grand Rapids, was about nine. It showed and proved clearly that the field was pretty well saturated by telephones. So, if there are enough telephones in a city to properly conduct the business, as in the Independent Telephone Exchange in Grand Rapids, the calls will decrease in-

913 stead of increase.

Q. With the new telephones? A. Yes; in Grand Rapids, according to the population in 1890, and the present number of telephones in service, we would have one telephone to twenty-five people. In Washington, at the same ratia, they would have 9,171 telephones. New York would have 60,540 telephones; and Detroit would have 8,226 telephones; and in my opinion, if the number of telephones was one telephone to twenty-five people, the calls would not exceed nine per day.

Q. As chief of the construction and equipment of the Detroit Company and as superintendent of the Grand Rapids Company, have you ascertained the cost of installing the subscribers' equipments under the system at present in use in the Detroit Exchange of the Michigan Company? A. I have not, but I can approximate it very near, I think.

Q. Do so as nearly as you can, distinguishing if you can between grounded circuit equipment and the Blake transmitter and the long distance telephone equipment. A. As I understand you, it is simply placing the telephone in construction after the line is built?

Q. Yes; from the outer line of a building where the outside construction ends to the subscriber's wall, and the establishment of his instrument. The wall equipment I speak of is the ordinary equipment.

Mr. WILSON: Do you mean the wall inside?

Mr. BIRNEY: The wall inside.

A. Where the return ground system is used, the same
914 amount of wire is used in both cases. So a grounded telephone can be installed, including the wire and labor, for $2.00. I think $2.50 would be ample for a metallic circuit instrument using three cells Fuller battery.

Q. You would make then a difference of fifty cents in the cost of installing the two types of instrument? A. Yes, sir.

Q. What does that estimate include? A. That estimate includes wire, labor, installing the telephone on the wall and the cartage on the instruments or telephones to the place where they are to be installed.

Q. Will you give us the cost of the grounded circuit instrument? A. The Blake Transmitter?

Q. Yes. A. The magneto bell used by the Bell Telephone Company of this city cost them $6.25. The backboards cost them forty-eight cents or fifty cents.

Q. The transmitter and receiver, I believe it is already in evidence, they do not buy? A. No. The hand telephone cord costs them ten cents and the battery about twenty-two cents, which I think is all outside of the hand telephone and the transmitter. I would say that the Michigan Company manufacture their own bells at $6.25.

Q. And what is the cost of the long distance equipment?
A. The backboards I do not know the cost of. The bells are different classes of bells altogether; that is, the mag-
915 neto bells have platinum contacts, and my impression is that the last bells that they bought were somewhere in the neighborhood of $9.00. The backboards were about $2.50. The three cells of Fuller battery cost somewhere between sixty-five and eighty cents apiece.

Mr. WORTHINGTON: Each cell?

A. Each cell; yes, sir. The receiver cord cost ten cents.

Q. Somewhere about $14.00 per instrument then? A. If that is what it figures up at.

Q. And for installing that equipment you say the cost would be about $2.50? A. $2.50 would cover it.

Q. Are you familiar with the cost of laying conduits in the city of Detroit for telephone use? A. Not in detail; but I have made the estimates of all the work done in the past two years, or about two years, and we always figured 19 cents per duct foot, including manholes. I might state that the manholes cost the Michigan Telephone Company $56.

Q. Each? A. Each; but the 19 cents per duct foot included the manholes. That manhole has a railroad iron roof, which is special to this city so far as I know.

Q. In other respects is the manhole similar to that used in other cities? A. Yes, sir; in most cases we have foot walls and a six by eight manhole trap, ventilated through the manhole covers.

916 Under what kind of pavements were these conduits laid? A. They were mostly laid under block.

Q. What kind of block? A. Cedar block.

Q. And elsewhere, how was it? A. As a general thing the conduit was either put in at the time the pavements were changed from block to brick or asphalt or they had been in previous to the time that that style of pavements were used here in the city.

Q. What is the character of the conduit construction? Is it the solid system or the drawing-in system? A. I don't understand.

Q. Just go on and explain them. A. The first that was put in here were known as the Dorsett system, which was a cylinder shape, with, I think it was, nine 2½-inch ducts. Then they put in quite a number of 2½ and 3-inch creosoted wood log. Then the company changed to the national conduit, 3-inch conduit, which is iron pipes cement lined. Then they put in the square vitrified clay, which is also three-inch duct.

Q. How long have they been laying that last kind of conduit? A. I think they started it in 1892, and as I remember it, the first they laid in this city was at the time they went in the new building.

Q. How was that conduit laid? A. It was laid in cement, three inches of cement on the bottom, three inches on

917 the sides, and three inches on the top.

Q. How are the cables inserted in the ducts in that system? A. The ducts are first rodded and a rope is pulled through, which in turn the cable is attached to and pulled through the ducts.

Q. Are you able to state from your experience, Mr. Boyce, which is the more expensive to maintain of the two systems after they are once in operation, the overhead or the underground? A. The overhead costs the most money to maintain.

Q. Why? A. One of the principal reasons is that it is hard to guy poles in cities, and it is pretty nearly impossible in some places to get the wires through in a way that they should be strong to overcome and to get around through electric wires, which in itself means defective construction. It is subject to the elements, such as sleet and wind storms, all these objections being entirely overcome by the use of underground cables, properly protected from electrolysis. In Detroit there was only one positive reeding, which means a dangerous reeding in the underground system; and in that the action

was so light that it would probably take a long while to develop any trouble.

Q. By that you mean that electrolysis was indicated only once? A. After the remedies were applied.

Q. What remedies were applied or what precautions were taken against it? A. A large copper wire was connected to the cables and connected to the negative buss bar at the power station of the street railway company. Also all cables were thoroughly bound together at every fourth or fifth manhole throughout the city.

Q. Is that in your opinion a protection against electrolysis? A. There is no question but what it is a protection.

Q. During the time of your connection with the Detroit Company what expense, if any, was the Company put to in repairs of the underground part of its system? A. We have lost several cables in town by electrolysis. I remember at present three cases in which we had to throw out sections of cable and replace them by new ones.

Q. Was that before or after these precautions were taken that you mentioned? A. That was before; and in several places we found leaks in the sleeves of the manholes.

Q. Were those leaks expensive to repair? A. In one case we had to draw in a section of the cable.

Q. What other cost was the company put to, if any? A. That is the only cost except in four places, where a fire had destroyed the terminal poles.

Q. Those fires did not affect the underground working as I understand you, except as they destroyed the poles through which the underground work rose? A. And the underground cable.

Q. At those poles? A. Yes, sir; that is due to a defective protection.

Q. How could that have been guarded against? A. It could have been guarded against by putting in tubular fuses, which the Michigan Company have never used.

Q. Which is the more expensive system to construct, the underground or the overhead? A. It depends upon the number of wires. Without going into the matter carefully with the figures I would state that if there is over 400 pair, it would be much cheaper to go underground.

Q. 400 pairs in cables. A. In cables; that is 800 conductors.

Q. If a line is to carry 800 conductors, then which would be cheaper to construct, the underground system or the overhead? A. As I understand you previous to this it was the same question.

Q. Why it is cheaper in that case? A. Because it would be impossible to carry that amount of naked wires on the

poles. 150 wires, even using knobs, that is, 20 wires to the arm is about all that should be placed on poles. Then they have to go to cables again. Cable costs just about as much overhead as it does underground. All the difference is that the lead, in the one case, in the underground cable, is a little thicker than it is in the overhead cable.

920 Q. What is the present market price of 19-gauge, 100-pair cable? A. Forty-three cents. We have bought cable for the Grand Rapids Exchange recently for that price, but it was aerial cable.

Q. There is a difference in the cost of the aerial cable and the underground cable, is there? A. There is a slight difference; yes, sir.

Q. How much? A. I couldn't say. It is only a small amount.

Q. What do you mean by that? A. Something like one or two cents.

Q. Is there any difference, and if so, what, in the cost of operating an overhead system and an underground system. A. The underground system is the cheaper.

Q. By your answer do you mean to include maintenance with operating work, by which I mean the work done in the operating room or the work of transmitting messages? A. It makes no difference in the operating room unless they have inductive interferences, which, in overhead construction, are not as great as in an underground system. Of course, if the operators are hindered by a noisy line it means that they cannot take care of as many subscribers.

Q. Then your answer refers, as I understand you, to maintenance and not to operating? A. Yes, sir.

921 Q. Have you made a calculation at Grand Rapids of the cost to the company by which you are now employed of installing subscribers stations put up in the last year? A. No, sir; the regular inspectors of the exchange install all telephones. No separation has ever been made.

Q. What is the quality of equipment used by the Citizens' Telephone Company, of Grand Rapids? A. The telephones we are receiving now are first class. The switchboard is not first class. It has been changed once to my knowledge, and we are figuring on changing it again; and this constant changing of circuits is, of course, decidedly objectionable.

Q. Explain what you mean by that? A. I mean by that cutting and changing the wires and disarranging things. After a switchboard has been put up two or three times it is practically worthless unless it is re-wired.

Mr. WILSON: That is the condition of this new one, is it not?

A. No, we have got it so that it is working well, but it is not first-class equipment. There is no getting around that.

By Mr. BIRNEY:

Q. What is the quality of the service given to subscribers? A. The quality of the service is good. The talking service is better than is furnished by the Bell Company. The central office service is equally as good.

922 Cross-examination.

By Mr. WORTHINGTON:

Q. What compensation did you receive while you were employed by the Bell Detroit Company as superintendent of equipment? A. $135 per month.

Q. Do you know why it was that the Grand Rapids Company made the change by which you were invited to come up there and take charge of their work instead of having Mr. Ware continue in that office? A. It was a matter of improving the service.

Q. They thought you could do better with it than Mr. Ware? A. Than Mr. Ware; yes, sir.

Q. Then the service was not a success under his management? A. I have not improved it very much.

Q. You say the reason for taking you up there was the impression that you could improve it. A. Yes, sir; that was it.

Q. What were the troubles that it was thought you could overcome? A. It was simply my electrical knowledge. There was no particular trouble. I found some troubles in the exchange and removed them.

Q. What were they? A. One was a clearing out trouble.

Q. What was that? A. That was the principal trouble.

Q. What was that trouble? A. The drops would not
923 come in when the subscriber rang for a clearing-out signal.

Q. Then the operator had to inquire to find out if they were through? A. Yes, sir.

Q. That caused delay and interfered with the operator attending to other subscribers? A. The general service; yes, sir.

Q. How many drops did that affect? A. We found 27 per cent affected.

Q. How long had that been going on? A. I couldn't answer that.

Q. What were the other troubles you alleviated? A. We found a great many other places where they were talking through the impedence of bell ringers.

Q. Explain that, please. A. Impedence is a counter electro motive force. If you wrap a bar of soft iron with a great many

convolutions of wire, you make an impedence coil. The more convolutions the greater the impedence. It is not a matter of resistance, but a matter of turns.

Q. How had that interfered with the operation of that system before you went there and discovered the trouble? A. It interefered with it because talking through impedence muffles and reduces the efficiency of the transmission.

Q. In other, words you cannot hear so well? A. You cannot hear so well.

924 Q. How many lines were affected by that disease? A. I could not say now. I should judge, though, about 125.

Q. What other troubles was the system affected with? A. Those are the principal electrical troubles we found there.

Q. What were the other troubles besides the electrical ones? A. Of course with my early education in the telephone business I changed the discipline of the office quite a little.

Q. In what respect? A. In the handling of the operators.

Q. How? A. That is a pretty hard question to answer, but it is a matter of discipline.

Q. You have improved the efficiency of that office a great deal, one way and another? A. I think I have.

Q. And of the service? A. Yes, sir.

Q. If you have, the service was not good before, was it? A. It was not first class, but it was good. I have not improved it as much as I expected to. The mere fact that we are getting from sixty to ninety-three orders a month shows that the service is all right or we would not get the orders at an increased charge, the Bell Company charge being $24 and $12 and ours $30 and $20.

925 Q. How many of the leading citizens up there have a personal interest in this company of which you are manager, as stockholders or otherwise? A. Something over three hundred.

Q. Are they among the leading citizens of the place? A. They are.

Q. I understand that it is your experience at various places where you have been connected with telephone exchanges which lead you to the conclusion that the more subscribers the exchange has the fewer the average number of calls per subscriber? A. Yes, sir.

Q. And if you could get enough subscribers, none of them would use it at all? A. You couldn't get to that point, but it is a fact nevertheless in Grand Rapids; and it will apply in any time if you carry the same number of telephones to the population.

Q. Have you known any other case in which it has occurred with the same number of telephones to the population? A.

You can get that from the American Bell reports to your own satisfaction.

Q. I am not asking about the American Bell Telephone Company. I do not represent the American Bell Telephone Company any more than you do. I am asking you for your experience on that subject. A. The Grand Rapids and the Detroit exchanges are the only ones I can speak of.

926 Q. The Detroit exchange has not reached any such proportion as that, has it? A. If you compare it with other exchanges, with Louisville, Ky., which runs about 16 calls per telephone, where Detroit runs about 12 calls per telephone, Detroit has a greater number of telephones to the population.

Q. Do you know how it is in New York? A. No, sir.

Q. Do you know how it is in Philadelphia? A. No, sir.

Q. Baltimore? A. No, sir.

Q. San Francisco? A. No, sir.

Q. St. Louis? A. No, sir.

Q. Chicago? A. No, sir.

Q. Washington? A. No, sir.

Q. Let me ask you, if I am in an exchange which has a thousand telephones, miscellaneously distributed among residences and business houses, it is possible for me to make 999 different calls to those 999 subscribers, is it not? A. Yes, sir.

Q. If they have 2,000 subscribers, then it is possible for me to call 1,999? A. Yes, sir.

Q. The same would hold good of every other subscriber in the two exchanges? A. Yes, sir; but you have got to

927 take it a little farther than that to get the true comparison. In Grand Rapids, with the first subscribers, the operators answer 75 subscribers' lines; whereas, with the last subscribers connected, they are answering 100 subscribers' lines, and there is no doubt but what they could answer 150.

Q. No doubt in the world? A. No doubt in the world, and then not be as busy as the ones answering 75.

Q. Will you tell us, from your experience, whether there is any increase in the number of calls by a subscriber the more he finds out he can use his telephone and the more people with whom he can communicate. I think Mr. Birney brought that out down in Washington. I would like to know how that is here? A. I don't know. I never heard that question before, and I could not anser it.

Q. You do not know whether it is so or not? A. No, sir; there is no question but what a man can educate himself to use a telephone and they do do it.

Q. What connection had you with the operating room here in Detroit? A. I was chief operator. I had charge of the operating force.

Q. How was it when you were in Grand Rapids, when you were with the Bell Company there? A. I was manager of the exchange.

Q. You have been connected with the Grand Rapids Company, the Citizens' Company, for four months, I think. A. About four months; yes, sir.

928 Q. How many, if any, tests have been made since that time to show the total number of calls or the number of calls per subscriber? A. There hasn't been any made.

Q. You do not know, then, during the time you have actually been there, whether the number of calls has increased or decreased? A. No, sir.

Q. Either in the aggregate or per subscriber? A. No, sir.

Q. Or for any particular part of your board? A. Yes, sir; because in some parts of the board it indicates itself, from the simple fact that one part of the system does not take as many operators as the other part.

Q. Has that increased or decreased in the four months you have been there? A. No; I do not know that it has.

Q. The proportion remains the same? A. Of course, before Christmas was a very busy time, and it would run up, but now it is running down. It is a natural consequence.

Q. My question is, do you know whether or not the number of calls made by any particular portion of your subscribers up there has increased during the four months you have been there? A. I could not say.

Q. What is your experience as to whether the efficiency of the system has anything to do with the number of calls? A. It certainly has.

929 Q. The better the service the more the calls? A. Yes, sir.

Q. And if, as the number of subscribers increases, the efficiency of the service falls off, what would you expect? A. As the number of subscribers increases?

Q. Yes; and the efficiency falls off, becomes poor. A. It naturally would become poorer on account of striking busy lines. You spoke before of the average number of calls per telephone. Now you are bringing in a different factor.

Q. I am bringing in now what you have told us about the inefficiency of the service up there under Mr. Ware.

Mr. BIRNEY: That is objected to, as there has been no such testimony.

A. The old subscribers will certainly be busier in a large exchange of 2,400 than they would be in an exchange of 1,200; but the connected subscribers hold the average down and keep it down; that is, the average calls per subscriber.

Q. That is, assuming that the new subscribers are of a class that will have less use for telephones than the old ones? A.

Yes, sir; but they will call the old ones and they will run up. The incoming calls and the outgoing calls will both run up. There is no question about that.

Q. You have, then, as I understand you, no personal knowledge whatever of the number of calls at the Grand Rapids exchange at any time, the Citizens' Company? A. No per-

930 sonal knowledge.

Q. I wish you would describe a little more in detail the kinds of conduits that were laid by the Detroit Company when you were its superintendent here. You have given us the names of the different systems, but you have not told us very much about what kinds of conduits they were and how deep they were laid? A. As a general thing they are laid under the frost line.

Q. What is the frost line in this region? A. Three feet from the surface. That is about the average depth, and you go deeper with the trench as the number of ducts increase.

Q. You mean the top construction was three feet from the surface. Do you mean the top of the duct or the top of the cement covering when it was covered with cement? A. I mean the top of the duct to the top of the pavement.

Q. Do you know of your own knowledge what those conduits cost? A. No, sir; I was instructed by our general superintendent, Mr. Lyon, to figure all conduits at 19 cents in Detroit, but I never saw the reports of the work.

Q. To figure them where and how? A. 19 cents per duct foot.

Q. In what connection were you to figure them? A. That was the estimate on the regular average duct foot, as in Grand Rapids. When we figure that system we figured 19 cents per duct foot.

Q. Have they underground conduits in Grand Rapids?

931 A. Yes, sir.

Q. Of the Bell Company? A. Yes, sir.

Q. That was in making the estimate before the work was done? A. Yes, sir.

Q. Getting an appropriation? A. Getting an appropriation, I presume.

Q. You do not know of your own knowledge how the actual cost compared with the estimate? A. No, sir; I never saw the actual cost.

Q. Do you know what the cables cost that were put in? A. I have seen the bills.

Q. Were the cables all of one kind? A. No, sir; the Bell Company has both the standard underground cable in this town and the Western Electric cables.

Q. Are the Western Electric Cables all of one size or different

sizes? Q. There are some 80 pair which are put in the 2½-inch duct. There are 100 pair, and in Grand Rapids, before I left the company, they ordered 150 pair.

Q. Can you tell us the cost of those respective cables per foot? A. I cannot tell you the cost of the 150 pair, but the 100 pair cost somewhere in the neighborhood of forty-three cents.

932 Q. Do you know what the Bell Company paid, either here or in Grand Rapids, for labor for laying conduits? A. No, sir.

Q. Do you know, in the first place, how much they paid their laborers? A. I don't know what the Bell Company paid in Grand Rapids; but we are hiring men there for $1.25 per day.

Q. Do you know what the Detroit Company paid for its labor in laying conduits? A. No, sir.

Q. You do not know, of course, the aggregate cost of laying conduits? A. No, sir; all I know is the estimate that was given me, or the amount per duct foot, including manholes and the price of the manhole. I know that to be $56.

Q. Do you make that estimate with the cost of the conduit to put down, or of the conduit itself? A. The conduit that they put down.

Q. Before it is put down? A. Yes, sir; before it is put down.

Q. Are the manholes all alike? You have given the cost as $56, as I understand. A. That is the average cost per manhole.

Q. When you were making an estimate, you put them in at $56? A. $56.

Q. You have no knowledge what they actually cost? A. I have never seen their cost; no. But that was the price that was always put in on the American Bell report, which was the report that went through my hands.

933 Q. You have told us about an improved switchboard that reduces the cost of operating? A. Yes, sir.

Q. Can a multiple board of the present type be changed into one of those or has it to be swept aside? A. It has to be replaced by the new system.

Q. How long have those switchboards been in use in Cleveland and Louisville and Indianapolis, or can you tell us? A. The first switchboard put in was put in near Boston, at Worcester.

Q. You know that from hearsay, I suppose? A. I know that from hearsay; yes, sir.

Q. When was that? A. I should judge about two years ago.

Q. Do you know whether that board is still in use there? A. I think it is.

Q. That is hearsay too, I suppose. A. I simply know that it is a good switchboard and they would not take it out.

Q. What do you mean by that—that because you know it is a good switchboard, nobody else could have thought differently? A. It could not have been discontinued. They have changed the system, so that in that system, as I remember now, there are three different sets of batteries. In the relay system No. 3, which is the last I know about, four months ago, there is one set of batteries.

934 Q. How many times has the system of switchboard changed during the time you have had knowledge of them? A. The first multiple switchboard I know of was put in in Detroit, a board manufactured by the Western Electric; and the Scribner patents patents were used.

Q. Was that the best type known? A. It was then.

Q. How long was it the best known? A. I couldn't say how long. It was in use until—

Q. I am not asking you how long it was in use, but how long did it continue to be the best switchboard known to the profession? A. I can't say how long; but the next switchboard that came in was the branch terminal.

Q. How long did it last? A. That was a very short time before the relay system. Detroit had the second branch terminal board.

Q. Are you so taken with the virtues of the relay No. 3 board, that you think it will last and will not be improved upon? A. They will certainly improve upon it. They have made improvements in the transmission since it was used.

Q. You think it possible, however, that such boards will be devised that that will be thrown away and something will take its place? A. It may be possible; but it is really the only great development in telephone switchboards that has been made since the multiple switchboard was first placed in service.

935 Q. Are you going to use that at Grand Rapids? A. The Bell Company?

Q. No; your Citizens' Company. A. We wish we could use it.

Q. Why do you not use it? A. I think we will put in a board that I have applied for patents on, if I can get the patents.

Q. That will be better? A. No; it will not be any better. It has the same operating advantages, but not the same battery for transmission.

Q. Why do they not put in this new board of which you speak so highly, the relay No. 3? A. The Western Electric Company would not furnish the independent company with that board.

Q. How do you know that? A. They have refused to furnish us with equipment in Grand Rapids.

Q. Have you asked them to furnish you with one of these switchboards? A. No, sir.

Q. Has the kind which you have devised ever been used anywhere? A. We have tested it locally.

Q. Have you built one of the switchboards according to your system? A. We have built a small one; yes, sir.

Q. How many drops? A. Two.

936 Q. *It worked beautifully for two drops?* A. It can be made to work for two drops or two thousand drops. It is purely a matter of attachment and working of the patent drops.

Q. If you get out your patents are you going to allow the public to use them without paying you any royalties? A. I have agreed with the Grand Rapids Company to use my patents.

Q. What about the people who do not live in Grand Rapids? A. They will certainly pay me something for it.

Q. You believe in monopolies to that extent, do you? A. I do. Some monopolies are not an objection.

Q. The relay No. 3, how long has it been in use in Louisville? A. I can't state. Mr. Lyon, the general superintendent of the Michigan Company, and myself were sent down there, I think it was in the month of February last.

Q. Less than a year ago? A. Yes; ten months ago.

Q. How long has it been in use in Indianapolis? A. They had just started it up. It was on the same trip that we made to Louisville that we went there. We made a trip to the two towns.

Q. Do you know what those boards cost in those cities, Worcester, Louisville and Indianapolis? A. No; I did not know the cost of all the parts. I know what the Grand Rapids system will cost, which is the relay No. 3 system, called the Major System by the Western Electric people, and

937 which is practically the same thing at Louisville and Indianapolis.

Q. Do I understand that the relay No. 3 board is in use at Grand Rapids? A. It will be in use in Grand Rapids. It was ordered before I left here, for use in Grand Rapids.

Q. By the Bell people? A. By the Bell people.

Q. Do you know what it is to cost? A. Yes, sir.

Q. How many drops? A. 1,440.

Q. What is its cost? A. About $27,000—about that amount.

Q. That includes everything, ready for use? A. Ready for use.

Q. Suppose you have a multiple board of 2,200 subscribers, and you add a new section with 300 new subscribers' lines; what is done with reference to the existing part of the apparatus to bring the new subscribers in connection with the different operators? A. You have to add 300 jacks to each one of

the old sections. If you should add 300 to 2,200, you would have to add three times eight, there being eight sections, which would be 2,400 jacks to the old part of the system, and you would have to put 2,800 including the answering jacks to the new sections.

938 *Q. Then if you have a thousand subscribers and add* a thousand more, with a multiple board system, you have to run the wires representing the 1,000 new subscribers to the part of the board which was used for the old subscribers? A. Yes, sir.

Q. And likewise you have to run the wires representing your old subscribers to the board representing the new? A. Yes, sir.

Q. Then you would, so far as the multiple jack part of the system is concerned, have to multiply it by four when you doubled your subscribers? Is not that so? A. No, because it goes by sections. It does not go by subscribers. Will you state that again?

Q. If you have 1,000 subscribers with a multiple switchboard and you add 1,000 subscribers to it, supposing the capacity of the whole board to be 1,000 drops— A. Yes, sir.

Q. You, in the first place, then have to double the extent of your switchboard to get in the one thousand new subscribers? A. Yes.

Q. Then, as to the former board, you have to run the 1,000 wires to each of the parts of the old board? A. Yes.

Q. And you have to run the 1,000 wires representing the old subscribers to the new board? A. Yes.

939 Q. Do you not then, so far as the multiple jack part of the system is concerned, multiply it by four when you double your subscribers? A. We do in that particular case, yes.

Q. Let us suppose there should possibly be a case where in doing that the result would be that the number of calls per subscriber would be doubled also, and that, unlike the good people up in Grand Rapids, the people in the city I am supposing, each would use the telephone twice as much with 2,000 subscribers as with only 1,000. What would be the effect on your switchboard, supposing that when you added the 1,000 subscribers each operator was worked to her full capacity? A. That is, they would use the telephone twice as much?

Q. Yes. A. It would take twice as many operators, if that was the case.

Q. Would it not take twice as many operators when you added the 1,000 without any reference to the number of calls per subscriber? A. Yes, sir.

Q. If the subscribers are doubled and the number of calls per subscriber is doubled also, that would increase the number four times, would it not? A. Yes; if such things are possible.

Q. I suppose in that case the multiple jack part of the switchboard would have to be multiplied by eight, would it not? A. The jacks are fixed, regardless of the number of
940 calls.

Q. If, with 1,000 subscribers, the operators are worked to their full capacity, and you add 1,000 subscribers of the same kind, the number of operators would be doubled, would it not? A. The operators would be doubled; yes.

Q. And then at the same time, if you double the number of calls made by each subscriber, you would have to double the number of operators again, would you not? A. I can't carry you through there. I see what you are driving at?

Q. Then why can you not carry me through? A. You say that if the subscribers are doubled and the calls are doubled—

Q. And the calls per subscriber doubled? A. You multiply by eight?

Q. No, I asked you whether you would not multiply your number of operators by four, and the dimensions of the multiple part of your switchboard by eight A. (After pause) No; you would multiply your whole switchboard by four, would you not? I don't just see it.

Q. Mr. Boyce, in the case I have supposed you agree that the number of operators would be multipled by four, supposing my premises to be correct? A. Yes.

Q. Would there not be in front of each operator 2,000 multiple jacks instead of 1,000? A. They would be in front of each three operators.

Q. Well, each three operators? A. Yes; that is
941 brought about on account of the operator not being able to reach, and as she is answering twice the number of calls she is working up to her maximum capacity, and you give her twice as much work to do so that you have to put in two operators to do the work that one operator has done.

Q. In the multiple system, each three operators have all the wires in front of them? A. Yes, sir.

Q. And if you multiply the number of operators by four and then put in front of each set of operators or on each section of the board double the number of multiple jacks you had before, you have increased them by eight, have you not? Is not that plain? A. No; it is not plain to me.

Q. Very well; we will adjourn until morning. A. It may be true, but I cannot see it.

CHARLES L. BOYCE,
By the Examiner by Consent.

The further taking of these depositions was hereupon adjourned until Saturday morning, January 14th, 1899, at 9 o'clock a. m., at room 6, Cadillac Hotel, Detroit, Michigan.

942 Room 6, Hotel Cadillac, DETROIT, MICHIGAN,
Saturday, *January* 14*th*, 1899, 9 o'clock A. M.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. BIRNEY.
Present on behalf of the defendant, Mr. WILSON and Mr. WORTHINGTON.

JOSEPH B. WARE, was recalled for further cross-examination.

By Mr. WORTHINGTON:

Q. Mr. Ware, has your company at Grand Rapids borrowed any money since its organization? A. Yes, sir.

Q. How much and at what times? A. The most we ever borrowed at any one time was twenty-five thousand dollars. That was during our first year, and was gradually repaid until it was reduced down to six thousand dollars about six months ago. It has been increased to ten thousand dollars to take care of our pole line construction that I spoke of yesterday. I think the average would be about fourteen thousand dollars from the time we started, possibly.

Q. When did you borrow the twenty-five thousand dollars? A. During our first year.

Q. Have you stated all the facts in regard to your company borrowing money? A. Yes, sir; all the money bor-
943 rowed. I have not included items that we are owing for material. I do not consider that a part of the money borrowed, in the ordinary sense of the term.

Q. What amount did you owe on that account? A. We are owing from five thousand to seven thousand dollars, usually; sometimes a trifle less; but it ranges about from five to seven thousand dollars.

Q. Was any part of your stock paid up in promissory notes? A. No, sir.

Q. Or other paper? A. We have had thirteen hundred dollars in promissory notes; that is all.

Q. Can you tell us whether or not your company is not now projecting a new switchboard for its exchange? A. No, sir; we are not. We recognize that a multiple board would be economy for us in operation and we anticipate that in the future there will come a time when we will want a new board, but there have been no steps taken in the direction as yet—nothing definite.

Q. What board do you expect to use if you get a multiple board? A. Inasmuch as we have taken no steps in the matter I cannot answer the question.

Q. There is no thought now of getting a new switchboard? A. No, not at present. The multiple board has not
944 been open for use, as we have understood it, until this month.

Redirect examination.

By Mr. BIRNEY:

Q. Mr. Ware, do you furnish any telephones free of cost in your city; if so, how many and to whom? A. Yes, sir; under our franchise we give the city twelve free telephones in the city departments. By the way, when you asked one question yesterday I did not think that indirectly this might be a franchise fee. I believe that is what you generally call it—a franchise fee. We furnish the city twelve free telephones under our franchise. It is one of the conditions. We furnish to the benevolent institutions of the city, the hospitals and the orphan homes, etc., fourteen free telephones; so that we have nearly thirty free telephones altogether in the city.

Q. You have included those in your number of telephones in operation? A. Yes, sir; we included all telephones that were actually in operation, whether they were being paid for or not.

By Mr. WORTHINGTON:

Q. Do you get your charter from the State or from the city? A. We are incorporated under the State law, but we get our charter from the city of Grand Rapids.

945 Q. Is that charter recorded anywhere? A. It is accepted from the city, that is all.

Q. Is that charater on record anywhere, or a copy of it, where it is open to the public? A. The city clerk can furnish a copy of it. It is printed in the minutes of the Council. The Council passes the charter and we accept of it.

By Mr. BIRNEY:

Q. That is in the form of an ordinance, is it not? A. It is in the form of an ordinance.

JOSEPH B. WARE,
By the Examiner by Consent.

Subscribed and sworn to before me this —— day of ——, 1899.

Examiner in Chancery.

946 CHARLES L. BOYCE, resumed the witness chair for further cross-examination.

By Mr. WORTHINGTON:

Q. Mr. Boyce, from your knowledge of these matters will you state about what it would cost to construct ready for op-

eration a telephone exchange in Detroit to accommodate five thousand subscribers? A. That is a matter of calculation; I cannot answer it off-hand.

Q. Can you not approximate it at all? Is there not some approximate ratio of cost to subscribers? A. I can approximate it safely at $110 per subscriber.

Q. Safely at $110 per subscriber? A. Yes, sir.

Q. You mean it would not take more than that? A. Yes, sir.

Q. That would be, say $550,000? A. Yes, sir.

Q. And it might be considerably less than that? A. It may be.

Q. What would be the minimum? A. I should say the minimum would be about $80.

Q. Or $400,000? A. Yes, sir.

Q. Are you making that estimate for an overhead or an underground plant, or, as the plants here are constructed, divided between the two? A. Divided between the two.

947 Q. Approximately just such plants as are here now? A. Yes, sir.

Q. Can you describe the telephone which is in use by the Bell companies in Michigan, with whose plants you are familiar? A. Yes, sir.

Q. And which is used on their metallic circuit? A. Yes, sir.

Q. So as to operate in connection with long distance lines? A. Yes, sir.

Q. Please do so. A. On the long distance line is a granular carbon transmitter that is known as the solid back transmitter, the one in common use throughout the United States for that class of service. On grounded lines, which are greatly in the majority in Michigan, they have the old Blake transmitter. In Michigan the Bell company has a better class of magneto bells, being bells that have platinum contacts and are first class in all respects. Their grounded lines apparatus, which is made in the Michigan company's shops, is decidedly defective.

Q. Can you tell us what are the rates charged in Detroit for the metallic circuit with the solid back telephone? A. I do not know that rate.

Q. You do not know what that is? A. No, sir.

948 Q. It is a good deal more than the rates which are charged for other instruments, is it not? A. Yes, sir.

Q. Can you tell us what is the comparative efficiency of the solid back telephone and the Blake transmitter? A. I have talked from my residence to Chicago with the Blake transmitter. I think it would be impossible to talk to New York satisfactorily with the Blake transmitter. A solid back will do the work, which is the Bell long distance instrument.

Q. There is no question, is there, that the solid back telephone is a great improvement on any other known instrument at this time for long distance work? A. It is the most efficient as far as I know.

Q. Is that in use by any of the independent companies? A. No, sir.

Q. Is it covered by a patent? A. That I could not say.

Q. If it is not covered by a patent why do not the independent companies use it, if it is better than others for long distance work? A. I can't say why they do not use it. At a comparative test of transmitters made by the Western Electric Company—

Q. Were you present when that test was made? A. No, sir.

Q. Then I object to this hearsay evidence. You can go on with your answer if Mr. Birney consents to it.

Mr. BIRNEY: Yes.

949 A. A comparative test showed that the independent telephone with the same amount of battery was within eighty per cent of the solid back transmitter.

By Mr. HEMPHILL:

Q. Within eighty per cent? A. Within eighty per cent, and I have also understood that the telephones of the independent companies have been tested on the long distance Bell lines and have worked successfully.

Mr. WORTHINGTON: I object to this as hearsay evidence.

By Mr. HEMPHILL:

Q. You have never made any such test yourself nor participated in it? A. No, sir; I have talked successfully across our State with the transmitters in use by the independent company at Grand Rapids.

Q. How far is it across your State? A. By wire it is approximately 160 miles.

Q. Have you considered since we separated last night the question which was pending when we adjourned? A. I have.

Q. What answer do you make to the question now? A. That in case the calls were doubled and the subscribers were doubled the operators would be multiplied by four and the switchboards would be multiplied by eight; that is, the jack capacity of the switchboard. That is due to the seating capacity of the operator. In practice it has never, to my knowledge, worked out that way. I consider it is entirely out of the question.

950 It is simply an impossibility that the calls would double as the subscribers would double.

Q. You say, then, upon your oath, that it is a thing that has not happened in any city of the United States? A. It has not happened in Michigan.

Q. In Michigan? A. That is the only territory I am thoroughly acquainted with.

Q. Do you think that if that is impossible in Michigan it is possible elsewhere? A. That I could not say.

Q. Have you any opinion which would lead you to suppose that the talking capacity of the people in Michigan under given circumstances is different from that of the people in other parts of the United States? A. No, sir.

Q. Do you undertake to say upon your oath that the doubling of the calls per subscriber has not doubled as the subscribers doubled repeatedly in various cities of the United States? A. They have not in Michigan.

Q. In what exchanges in Michigan have you had opportunities to observe that of your own knowledge and not from hearsay? A. At Muskegon, at the Grand Rapids Bell office. As to Detroit I cannot state, because in the early days of the exchange I was not acquainted with the conditions; but
951 there is no question but they had nearly as many calls back in 1890, or that they were half as large then as they are at the present time.

Q. Were you connected with them in 1890? A. Yes, sir.

Q. What opportunity had you to know the number of calls then? A. In Detroit?

Q. Yes. A. I was in Grand Rapids in 1890.

Q. You mentioned Muskegon as the first instance. Were you in Muskegon in the early days of the telephone exchange there? A. I was.

Q. How many subscribers have they there now? A. They have about one hundred and fifty.

Q. What do you know of your own knowledge as to the number of calls there per day? A. They have one operator taking care of one hundred and fifty subscribers.

Q. That does not answer my question. How many calls do those subscribers make per day? A. That I could not state. From the fact that one operator is handling the entire business when it used to take an operator to seventy-five lines, we have proved they are not doing the amount of business they used to at the time when I had the management of the exchange.

Q. How long has the Muskegon switchboard been in
952 use—the one they have now? A. I think it is about between eight and ten years.

Q. Have there been any improvements made in it? A. No, sir.

Q. There have not? A. Not at Muskegon.

Q. What kind of a board is it? A. It is known as the Detroit Electric Works Board.

Q. Do you know how many calls per day were made at Muskegon when they had seventy-five subscribers? A. No, sir.

Q. Do you know how many calls per day were made at Muskegon at any time? A. I cannot state now, although I have made reports for the American Bell Telephone Company. I cannot give the exact number, but the calls in Muskegon ran about eight per subscriber when I was manager there.

Q. About eight per day per subscriber? A. Yes, sir.

Q. You, of course, have no personal knowledge as to the number of calls that have been made per day per subscriber at any time in Washington? A. I have not.

Q. Do you know what are the rates charged at any place in Michigan and what they have been for full metallic equipment with the solid back telephone? A. In Detroit, as I remember it, it is $108 for a business place—a solid back transmitter.

Q. Do you know what it is for residences? A. No, sir.

953 Q. Was it not more than that in many cases, and is it not now? A. It may have been where mileage has been added to the line.

Q. Can you give us any information as to what it costs to lay conduits in Detroit when an asphalt sheet pavement is to be removed and replaced? A. No, sir; I was always told in making estimates, when I made the estimates for the Michigan Telephone Company up until about four months ago, to figure nineteen cents.

Q. You have told us that; and you did that without reference to the depth of the trench or the nature of the pavement? A. No, sir; that was considered the running foot. Nineteen cents were the figures that were made at Grand Rapids.

Q. Do you know whether any conduits of the different types which you described in your direct examination constructed by the Bell Company in Detroit have been abandoned? A. When the change was made from the Griswold street office to the present office there were a number of conduits that were discontinued on account of the moving.

Q. Have any of them been abandoned on any other account, or do you know? A. Yes, sir; there are some wood log conduits in town. I cannot say the extent they have been discontinued.

Q. How long were those in use before they were dis-

954 continued? A. I cannot state that.

Q. Have you had any experience in keeping up underground telephone plant outside of Detroit? A. I have had the experience and done the engineering for electrolysis, protecting the system from dangerous currents of car companies. I took care of that in person.

Q. I think you misunderstood my question. I will ask the stenographer to read it again.

The question was repeated as follows:

Q. Have you had any experience in keeping up underground telephone plant outside of Detroit? A. No, sir.

Q. Can you tell us what was the cost during any one year of maintaining the underground plant of the Detroit company here? A. I cannot; no, sir.

Q. Can you tell us what was the cost of maintaining the overhead plant of that company during any year? A. I cannot.

Q. Can you tell us what was the cost of maintaining either the underground or overhead plant in the aggregate while you were with the company? A. No, sir. It is a fact that I have learned from observation that the underground system can be maintained much cheaper than the overhead system, being in constant contact with the department that took care of the two different systems.

955 Q. Can you tell me why that is in any more detail? A. As I stated yesterday, one is subject to the elements, such as sleet storms and wind storms, and on account of the great number of objections to guying the poles properly the objections of other wires being near these, and from inductive troubles, there is a constant expense to the overhead construction which does not exist in the underground construction.

Q. Have you ever figured out in percentages what could be a proper allowance for depreciation for overhead and for underground plant? A. Not that I can recall now. I have made those figures, but I do not remember the results.

Q. Can you approximate it at all? A. I would not want to approximate it now; no, sir.

Q. What, in your judgment, under prudent business management, would be a proper percentage of the cost of an overhead plant to set aside to allow for depreciation from the causes you have referred to and other troubles? A. Eight per cent would surely cover it. There is no question about that. There are lines in this town that are good lines to-day that have been in operation for twelve years.

Q. Could you approximate the cost of the overhead system of the Detroit Bell Company here? A. I could not.

Q. You could not give us any sort of an estimate of it. You are pretty familiar with it, are you not? A. I have been

956 familiar with it, yes, and the care of it; but it is the system of the Bell Telephone Company to keep this information to themselves. No one knows it, and when I was making those estimates I was simply given the figures to make the estimates on.

Q. You know the extent of this overhead plant, and you know the value of the different parts of it, what it would cost to replace it, do you not? A. I know what I could replace it for. I would take the contract to replace it for $110 to-day.

Q. I am asking you as to the value of the overhead system of the Detroit Bell Company. What would it cost to replace that, about? A. I would take the contract to replace the entire exchange, including their underground and overhead, for $110.

Q. Per line? A. Per line, per subscriber.

Q. About what percentage of that $110 per line would you apply to overhead and what to underground work? A. I think it is nearly equal in this town.

Q. Do you know what damage was done to the overhead plant of the Detroit Bell Company by the recent sleet storm? A. No, sir.

Q. Do you know whether or not the damage from that single storm amounted to eight per cent of the value of the overhead plant? A. The line that I cited, which I stated had been
957 up for about twelve years, the Grand River line, and I understand that is one of the lines that is broken down by the sleet storm--

Q. You will perceive you have not answered my question at all. The stenographer will read it.

The last question was repeated.

A. No, sir.

Q. Do you know that it did not? A. I know nothing about the storm.

Q. Are you acquainted in a general way with the plant of the Detroit Telephone Company—the independent company? A. In a general way; yes, sir.

Q. In your judgment about what amount per line would it cost to build that system in substantially the manner in which the existing plant is constructed? A. I should say $100 a line.

Q. That would be a maximum amount, would it? A. It would be a fair estimate of it.

Q. And if they had about 5,000 telephones you would allow about $500,000? A. Yes, sir.

Q. Where did you have the experience, Mr. Boyce, upon which you based your statement that after cutting up or changing a switchboard a few times it becomes worthless, and you have to throw it away? A. I did not intend to give
958 you that understanding. I say that a board, after it has been changed a number of times and cut over, as the Grand Rapids switchboard is changed, will naturally put defects in the board. We are now arranging in Grand Rapids to reconstruct and change some of the principal features of the board on account of that to get in better equipment.

Q. Did you not testify on your direct examination in almost these words that after a switchboard has been cut up a few times in changes it becomes worthless? A. I do not think I used the word worthless; no, sir.

Q. You think not? A. I think not.

At the request of defendant's counsel the stenographer here reads the testimony of the witness on direct examination as to a switchboard being practically worthless under certain circumstances unless it is rewired.

By Mr. HEMPHILL:

Q. Do you wish to change that statement in any degree? A. No, sir. In this case in Grand Rapids it is strictly true.

Q. How much of the cost of a switchboard is in the frame and how much in the wiring; what proportion? A. The Western Electric Company at the present time charge $125 for a frame. Take it, as I understand the Washington case, with 2,200 jacks and figuring it roughly it is about one-fourteenth of the cost of the switchboard.

959 Do I understand you to say that the naked switchboard costs one-fourteenth of what the switchboard wired costs? A. The switchboard frame without the equipment, as I understand your question; yes, sir.

Q. So that the switchboard represents about one-fourteenth of the expense and the wiring thirteen-fourteenths? A. No, sir; the switchboard frame represents about one-fourteenth of the expense.

Q. What is the proportion of what you mean by the expression, "wiring the board?" What proportion of the whole cost of an operating board is that? A. The labor in wiring.

Q. You said that under certain circumstances a switchboard is practically worthless unless re-wired. What do you mean by re-wiring? A. I mean that the circuits should be taken out and put in good condition by re-wiring—changing the wires. In our case in Grand Rapids it is a very simple matter. In the multiple switchboard it is a greater matter.

Redirect examination.

By Mr. BIRNEY:

Q. Mr. Boyce, I wish you would compare the efficiency of the long-distance type of telephone used by the independent companies in Michigan with the long-distance type used by the Bell Company. A. I have never made personal tests

960 of the two transmitters; but in Grand Rapids the service on the local lines is perfect—that is, the transmission.

Q. Is that over the long-distance type of telephone? A. Yes, sir; all telephones in use by the independent exchange in Grand Rapids are granular carbon transmitters.

Q. And is the service over those telephones equal to the service over the Bell Telephone long-distance transmitter in use in Detroit?

Mr. WORTHINGTON: I object to this leading form of examination.

A. It is, locally; yes, sir.

Q. In answer to one of Mr. Worthington's questions on the same line you said something to the effect that the efficiency of one of the independent long-distance telephones was, in your opinion, within eighty per cent. of the Bell telephone instrument? A. Yes, sir.

Q. What did you mean by that? Or did you mean to be so understood? A. I said that tests made by the Western Electric, which information was given me by Mr. McBurdy, the expert engineer of the Western Electric, showed that the efficiency of the independent telephones, stating the Stromberg-Carlston—

Mr. WORTHINGTON: This hearsay evidence is objected to as manifestly incompetent.

A. Was within eighty per cent.

Q. What do you mean by within eighty per cent?

Mr. WORTHINGTON: I object to that because it is calling upon this witness to state what the other man meant.

961 A. That if it can be compared by the length of the line and transmission can be successfully conducted over it, if the long-distance solid back transmitter would talk one thousand miles successfully the independent transmitter would talk eight hundred miles successfully.

Q. Is the Stromburg-Carlston instrument a granular carbon transmitter. A. It is.

Q. Speaking of your experience at Muskegon and with the number of telephones in operation in that town, did you mean the number of telephones in use by the local Bell Company or by the local independent company? A. By the local Bell Company.

Q. And your remarks referred altogether to that company? A. Yes, sir.

Q. You have been inquired of touching the fact of a recent severe storm in Michigan? A. Yes, sir.

Q. How long have you lived in Michigan? A. All my life.

Q. You are how old? A. Thirty-nine.

Q. How long has it been since a storm as severe as the one in question and as injurious to wires was experienced here in Michigan? A. They have had two severe storms this winter. One was in the Saginaw district and it touched Kalamazoo. The other one was in Detroit, which was a little later. The only other storm that I know of personally was one

962 we had in Grand Rapids, which broke down about seven

poles; and in all my experience that is the only storm that I have any definite knowledge of that was destructive to property to any great extent.

Q. How long ago was that storm in Grand Rapids that you speak of? A. That was somewhere near the year 1888.

Q. You were also asked to give your opinion of the cost of reproducing the Bell telephone plant in Detroit and the independent telephone plant in Detroit. Which of those plants is the more modern in construction? A. The Detroit Telephone Company.

Q. That is the independent company? A. Yes, sir; they have all the latest and best conduits. That is, it is considered the best by engineers. Their pole construction is really better, too.

Q. Then why did you place the cost of reproducing the Bell plant at $110 per line and estimate $100 per line as the cost of reproducing the independent company's plant? A. If I remember my statements correctly I said that $110 was the outside figure and that I would build the exchange for that; but I really think it can be built for $100 a line.

Q. And in building it at $110 a line would you expect to make some profit? A. Yes, sir.

CHARLES L. BOYCE,
By the Examiner, by consent.

Subscribed and sworn to before me this day of , 1899.

_____, _____,
Examiner in Chancery.

963 ROBERT J. FLEMING, a witness called by and on behalf of the complainants, having been first duly sworn, is examined:

By Mr. BIRNEY:

Q. State your name, residence and occupation. A. Robert J. Fleming; Toronto, Ontario, Canada; at the present time Assessment Commissioner for the City of Toronto.

Q. How long have you occupied that office? A. Nearly two years—a little over a year and a half; I think since the 5th of August, 1897.

Q. Before that time what official positions had you in the City of Toronto? A. I was Mayor of Toronto.

Q. For how long a period? A. I was elected four years, four times. I was Alderman four years before that—not immediately preceding it, but with two years between the position I occupied as Alderman and that of Mayor.

Q. Then you were elected three times to the mayorality? A. Four times—yes; I was re-elected three times.

Q. Before that time you served as Alderman? A. Yes, sir.

Q. Before that time did you hold official position in the city? A. No, sir.

Q As Assessment Commissioner of the city, what are your general duties? A. To value all the property in To-
964 ronto, both real and personal.

Q. For purposes of taxation? A. Yes, sir; I am responsible for the valuation of it all.

Q. How large a city is Toronto? A. In population, do you mean?

Q. Yes. A. The directory makers state about 230,000. We say 200,000. I think perhaps the directory may be nearer right. The area of it is perhaps 16 miles square, a little over 8 miles long and 2 miles, perhaps 3 miles at the widest place; at other points not over perhaps a mile—not quite that.

Q. How long have you lived in Toronto? A. All my life.

Q. How long is that? A. 42 years.

Q. Have you a telephone system in Toronto? A. Yes, sir.

Q. More than one? A. Just one system.

Q. By what company is that operated? A. The Bell Telephone Company.

Q. Do you know its full title? A. I think it is the Bell Telephone Company of Canada. I can tell you in a minute. I have their agreement here. The Bell Telephone Company is what they are designated here as.

965 Q. What is the system in use by that company, aerial or underground? A. Mostly underground.

Q. What proportion of it is underground? A. I couldn't tell you that exactly. The larger part of it.

Q. How are your streets paved? A. With asphalt, brick, block paving and macadam, generally. There is some stone, but very little—that is, square block stone.

Q. What proportion, speaking in a general way, is paved? A. Of the whole city?

Q. Yes. A. Two-thirds of it.

Q. What proportion of what may be called the business portion of the city? A. Is paved?

Q. Yes. A. All of the business part of Toronto is paved. Pardon me. What do you mean when you say paved? Do you mean with the different kinds of pavement I have mentioned?

Q. Yes. A. Yes; all of it.

Q. Do you know how long that telephone company has been operating in Toronto? A. No; I do not know exactly. Roughly speaking, they have been operating perhaps fifteen years. Yes, I should judge longer than that.

966 Q. Have you had occasion and opportunity in your official duties to determine the extent and value of the plant of that telephone company, with the number of instruments they have in use? A. Yes, partially.

Q. Please give us all the information you have on that subject.

Mr. WORTHINGTON: The objection heretofore made to evidence relating to telephone plants in other cities is renewed here, and also the understanding of counsel that this objection shall apply to the whole of the witness' testimony without being further repeated.

A. My recollection of their plant in the City of Toronto, according to the last assessment, was a little over $600,000. That is my recollection.

Q. That is the value of the plant? A. The value of the plant for assessing purposes.

Q. When assessing, upon what ratio do you determine the valuation to the real value? A. The law is, as it will be taken in payment of a just debt from a solvent debtor. That is the law upon the point. I think we allow 15 per cent for depreciation. I may say that on appeal that valuation was cut away down, possibly a sixth, because of a decision that had been given in the courts there to the effect that the plant of a company was to be valued as scrap in the different wards of the city, not as it would cost to erect, but what it was worth after being taken down, allowing for the labor in taking it

967 down.

Q. Do you know the capital stock of that company? A. I think it is $5,000,000.

Q. What is its territory? A. Over the whole of Canada.

Q. What are the other large cities in Canada, speaking in a general way? A. Montreal, Ottawa, Hamilton, London, Kingston, Winnepeg, Quebec, Halifax, St. John. There are a large number of other towns. I cannot think of them all.

Q. What rates for telephone service are charged by that company in Toronto? A. $25 for private houses and $45 for business houses.

Q. How long has that been the scale of charges? A. Since 1891.

Q. Before that time what was the rate? A. Immediately before that the rates were $50 and $30.

Q. $50 for business houses and $30 for residences? A. Yes, sir; I have an impression—I am not certain of it—that previous to that time, sometime, the rates were higher, but what they were I cannot say. I have that impression in my mind.

Q. Do you know how the rates are fixed, whether by legislation or otherwise? A. They were fixed by agreement, in the

first place, between the City Council and the company. That agreement has expired. The Bell Telephone Company has not raised the rates since that time, but I think it is because the law will not allow them to do it. They went to the Do-
968 minion Parliament for some legislation, I think possibly in 1894. I am not just certain as to the date. It may have been a little earlier than that; and the legislation was granted. I think there was a clause put in the legislation as it was going through the House or through the Senate to the effect that they were not to raise the rates beyond the present charges, and because of that I think wholly we are getting the rates from the Bell Telephone Company that we are getting.

Mr. WORTHINGTON: I object to all the testimony relating to what the witness thinks took place in Parliament and as to what he thinks was the effect upon the Bell Telephone Company's rates, of what he thinks the Legislature did, as being manifestly incompetent.

By Mr. BIRNEY:

Q. When was that agreement made with the City Council? A. In 1891.

Q. What was your position then? A. I was out of the Council in 1890 and 1891.

Q. How long did that agreement last? A. Five years.

Q. During that five years were you Mayor part of the time? A. Yes, sir.

Q. What were the rates fixed by that agreement? A. $45 for business houses and $25 for private houses.

Q. Do you know the bonded indebtedness of that company? A. I think I have a memorandum of it.

Q. You may refresh your recollection if you choose.
969 A. I don't remember, for the moment. (After examining paper). $500,000. They are authorized to issue bonds or indentures to the extent of $500,000.

By Mr. WORTHINGTON:

Q. You say they are authorized? A. Yes, sir; I don't know the extent to which they have issued them, but they are authorized by the act.

By Mr. BIRNEY:

Q. Have you had occasion recently to ascertain the market price of the stock of that company? A. Yes, sir.

Mr. WORTHINGTON: I object to that because the market price of the stock is no evidence whether the company is making money or not, in addition to the objection already made to

the evidence as to rates and other matters relating to telephone systems in other cities than Washington.

By Mr. BIRNEY:

Q. Please state what is and has been the market price of that stock within your knowledge? A. About 173 and 175 it is quoted daily.

Q. What is the par value? A. I guess it would be $100 par value.

Mr. WORTHINGTON: The witness' guess is likewise objected to as incompetent.

A. It is $100; I have no doubt about that.

By Mr. BIRNEY:

Q. Do you know the number of subscribers in Toronto? A. About 6,000.

970 Q. What taxes has the company paid to the city treasurer in the last six years? A. Pardon me. Do you mean the general taxes on their plant, &c.

Q. Yes. A. Or do you mean what they have paid the city or what bonus they have given the city.

Q. Both. A. I couldn't tell you offhand what the general taxes have been for the last six years. I don't remember what the assessed value of the property is, as confirmed by the court. I can get it for you without any trouble.

Q. What is the rate of taxation? A. 17½ mills to the dollar.

Q. Does your company pay anything to the city for its right to operate in the city? A. No; they do not now. They did under that agreement.

Q. What did they pay? A. They paid 5 per cent of their gross receipts, but that has been modified somewhat. The agreement is here. I think it about between $40,000 and $45,000 during the five years.

Q. What was the occasion, Mr. Fleming, of this contract made in 1891, if you know? A. The occasion was the offer of another company to install a plant in Toronto. The company was formed there to install a plant, and offered to supply the people with telephones for business houses for $35 and $25 for residences.

971 Mr. WORTHINGTON: That is the other company's offer?

A. That is the other company's offer to the city of Toronto. As soon as that offer gave the appearance of being bona fide the Bell Telephone Company then made a counter proposition to the city, and the offer of the Bell Telephone Company, although not as advantageous to the city as the other, was ac-

cepted, because the council did not wish to have a double telephone service in the city.

Q. Have you investigated the plant of that company to such an extent that you are able to say what is its quality and condition? A. Nothing except the reports from my men, who are out valuing it. I have not examined it myself. I would not know if I did.

Q. What is your official information upon that subject?

Mr. WORTHINGTON: I object to this for the additional reason that it is hearsay evidence, the witness having no personal knowledge as to the facts to which he is to testify.

A. In first-class condition. Personally I am not an electrician, and could not say.

By Mr. BIRNEY:

Q. You have stated that the number of telephones in use in the city is about 6,000? A. Yes, sir.

Q. Have you ascertained the average number of daily calls?

Mr. WORTHINGTON: Let me interpose and ask you how you get your information.

A. The Bell Telephone Company made application to
972 the Dominion Parliament for permission to raise the rates. The city of Toronto opposed that, and for the purpose of successfully opposing it I got up all the information I could in my department relating to the Bell Telephone Company in the city of Toronto.

By Mr. BIRNEY:

Q. How did you get up that information, and from what sources did you get the information? A. The information was got, a large part of it, by my men that I sent out to get the information; from our books, the books of the corporation, and so on. It all depends upon the part of it that you refer to.

Mr. WORTHITGTON: I object to this evidence as hearsay in addition to the reasons already made to all the testimony of this witness.

By Mr. BIRNEY:

Q. What did you find to be the average number of daily calls? A. 13.02

Q Is Toronto a business city? A. Yes, sir; quite.

Cross-examination.

By Mr. WORTHINGTON:

Q. Do you know whether the telephone company in Toronto

has any rates for special equipments differing from the rates you have testified to? A. Yes; I know they have.

973 Q. What are they? A. I cannot say exactly. I know if you have a main telephone in your room here and you desire to have one at your desk in another room, you have to pay extra for it. Just what that is, my impression is about $15, but I would not say that definitely.

Q. Without reference to any auxiliary instruments, do you know whether they have special instruments with special service for which they charge different rates? A. I do not.

Q. Are you acquainted with the technical differences between the different kinds of telephone instruments? A. No, sir.

Q. Or equipments? A. I have not the slightest knowledge.

Q. Do you know what a solid back telephone is as distinguished from a Blake transmitter? A. I do not.

Q. Do you know what a metallic circuit indicates? A. No; I would not even say that.

Q. You cannot tell us, then, what kind of service is furnished there? A. It is a metallic service and largely underground. I know that. It is a single wire service, but as to the technical names of it I could not tell.

Q. What do you mean by a single wire service? A. I couldn't even tell you that. My men just told me that a single wire service, metallic circuit, was used. I have only such knowledge as would come to me generally as mayor of

974 the city.

Q. Your information is that which you receive from your subordinates whom you send out to get it? A. Except the fact as to rates, and their application to Ottawa, and so on. That, of course, I know of my own knowledge, but the other I have to depend upon my men for.

Q. That is so as to the valuation you put upon the plant? A. Yes, sir.

Q. That valuation was, if I understand you, that the plant was worth about $700,000, and that after deducting the 15 per cent would bring it down to about $600,000? A. I think somewhere along there, speaking roughly, yes; and then it was cut away down by the courts for the reason that I have given.

Q. That is, valuing it as scrap? A. Yes, sir.

Q. Do you know what is the comparative cost of laying conduits such as are used by telephone companies in Toronto and in the cities of the United States? A. I would not think there was much difference.

Q. Have you any personal knowledge on the subject? A. No personal knowledge beyond this fact, that manufacturers are consulting me frequently, daily and weekly, as to building

in Toronto, and I find in comparing prices that there is practically no difference. The same union rate of wages pre-
975 vails in Canada as in the United States.

Q. What is the rate paid for day laborers in Toronto? A. About $1.25 per day, 12½ to 15 cents an hour, daily, of course.

Q. Do you know what telephone poles cost in Toronto? A. No; I couldn't tell you. I heard it all in the evidence, but I couldn't give it to you definitely. I question if they would be as high as in the United States. I don't think they are as high in the United States.

Q. What would be the difference? A. We are very near the source of supply there.

Q. You are also outside of the lumber tariff of the United States, are you not? A. Yes; I think the poles would be cheaper there.

Q. Do you know whether the tariff or other circumstances make any difference in the cost of wires that is used by telephone companies? A. I don't know, sir, as to that.

Q. Do you know whether or not the fact that switchboards and other patents issued by the United States do not affect users in Canada makes any difference in the cost of the inside equipment of a telephone office? A. I don't know. I do not pretend to know. I have simply a general knowledge.

Q. There are a great many people in Toronto who have a definite accurate knowledge of these things from actual experience, are there not? A. I don't think you could get it there from anybody except those just in connection with the
976 company.

Q. How do your men get it when they go out? A. We brought a man from the United States. We couldn't get one there. They are mostly connected with the company there.

Q. So the information which you have in Toronto is really gotten from somebody whom you brought from the United States? A. We brought over an engineer from the United States.

Q. Who was he? A. He was a man by the name of Duman.

Q. Where does he live? A. I think Detroit.

Q. He was from this city? A. Yes, sir; I think so.

Q. Do you know why it is that you are brought here to give us information which you got from a man who lives in Detroit? A. He is not living in Detroit; he is living in Toronto. He formerly lived in Detroit, so I believe.

Q. Do you know why you were brought here, then, instead of him, when he has personal knowledge and you have not? A. I don't know that, sir. I think the reason I was brought, possibly, was my knowledge of the agreement between the corpora-

tion and the company, and the Bell Telephone Company's application to Parliament, and so on. I was familiar with that, whereas the other man would not be.

Q. Was the application of the Bell Telephone Company to Parliament in writing? A. Oh, yes.

977 Q. And all the action that was taken on it is recorded there? A. Oh, yes; there is no doubt about that.

Mr. WORTHINGTON: I object to the witness's testimony in respect to this application of the Bell Telephone Company to Parliament and what was done by Parliament, on the ground that it is parol evidence of writing and especially of statutes and records.

By Mr. WORTHINGTON:

Q. Is there any law or custom in Canada which would prevent persons from obtaining from the public records copies of these papers? A. I do not think so.

Q. Can you tell me what kind of service, as to instruments and wire connections, the Bell Telephone Company furnishes in Toronto for $45 a month? A. No; it is good, though. I could not give you the technical names for it, but the service is good.

Q. What did you quote from when you informed us that the average number of daily calls in Toronto per subscriber is 13.02? A. That is the information one of my men brought in.

Q. When was that? A. Within a few months, at the time the application was before Parliament—within a few months.

Q. Did your men tell you where they got their information?

A. No; it was all prepared for our solicitor and my-

978 self. I passed it on to the solicitor.

Q. You do not know, then, whether he got it from somebody who told him he got it from somebody else? A. No; I don't think so. I think he could get it from the proper source. It was all made use of at Ottawa, and it was not denied in any way.

Q. I understand you were not able to get any information direct from the Bell people? A. I don't think that was my statement. I think my statement was to the effect that the engineers were mostly connected with it.

Q. Do you know whether or not your informant went to the Bell Company and to people who had personal knowledge and got his information? A. I do not.

Q. Or got it from somebody who got it from somebody else? A. I do not; but I do not believe he did.

Q. Why? A. Because he is a reliable man. He would not do it. He would give no information that he could not bank on—that he could not state.

Q. Your confidence in your agent, then, is the basis of your testimony? A. Yes.

Q. You have no personal knowledge, however, as to how he got the information? A. Yes; the gentleman I refer to is not Mr. Duman.

979 Q. Who is it? A. It is Mr. Page, in my office—Mr. H. J. Page.

Q. Where does he live? A. He lives in Toronto. He was born there. It was he who got that information in reference to the calls.

Q. He is in a position to testify himself if it is desired, is he not? A. Yes, sir.

ROBERT J. FLEMING,
By the Examiner, by consent.

Subscribed and sworn to before me, this —— day of ———,

1899.

———— ————,
Examiner in Chancery.

The further taking of these depositions was thereupon adjourned until 3 o'clock p. m., of the same day, at Room 1105, Majestic Building, Detroit, Michigan.

980 Room 1105, Majestic Building, Detroit, Mich.,
Saturday, January 14th, 1899, 3 o'clock p. m.

Met pursuant to adjournment.

Present:

On behalf of the complainant, Mr. Birney.

On behalf of the defendant, Mr. Worthington and Mr. Wilson.

Cross-examination of WILLIAM L. HOLMES resumed.

By Mr. WORTHINGTON:

Q. Mr. Holmes, were you connected at any time with any corporation here that had anything to do with telephone work except the three which were mentioned in your examination yesterday? A. Yes.

Q. What was the name of it? A. Before we started the Detroit Telephone Company, the company which let out the contracts and franchises here was known as the Detroit Telephone Construction Company. That company has not been doing any business for a couple of years.

Q. Who were the officers of that company when it was doing business? A. I was treasurer of the company, and am yet. The company is not out of existence, although it has not done any business. I think Mr. Albert Pack was president of the company.

Q. Who were the other officers? A. Mr. Flowers
981 was vice president and Mr. Verner was secretary of the company, I think.

Q. Who composed the board of directors of that corporation? A. Practically the same people that were in the Detroit Telephone Company at that time.

Q. Which company did you say was organized first? A. The Construction Company.

Q. How long before the Detroit Telephone Company was organized? A. I can't tell you just how long?

Q. Approximately; several months or several years? A. I don't think even an interval of several months. I know the franchise here was secured by the Construction Company and the contracts assigned to the Telephone Company.

Q. We know what you mean by the franchise. What do you mean by the contracts? A. The contracts for the telephone service. Before we began doing business here we had secured a lot of contracts for telephone service from subscribers.

Q. How many? A. I think three thousand or four thousand.

Q. When you say "we" you mean the Detroit Construction Company? A. Yes.

Q. Had that company done anything in the way of erecting a plant? A. Not at that time; no, sir.

982 Q. Did it do anything in that line before the Detroit Telephone Company was organized? A. No, sir.

Q. Did it at any time? A. No.

Q. It never did any part of the work of construction? A. No, sir.

Q. You say the Detroit Construction Company assigned its franchise and the contracts with subscribers to the Detroit Telephone Company? A. Yes; generally.

Q. Did it get anything for them? A. Yes, sir.

Q. What did it get?

Mr. BIRNEY: Objected to as utterly immaterial and irrelevant.

A. That is a matter that I do not think I care to reveal.

Q. Do you refuse to do so? A. Yes.

Q. You were one of the board of directors of both companies at the time? A. Yes.

Q. The boards of directors of the two companies were practically identical? A. Yes.

Q. Were the stockholders the same. A. Practically,
983 yes.

Q. Were there any stockholders in the Detroit Construction Company except the officers and board of directors? A. Very few.

Q. Were there not a good many other stockholders in the Detroit Telephone Company? A. Not at that time; no.

Q. How much stock of the Detroit Telephone Company was transferred to the Detroit Construction Company in consideration of this transfer of the franchise and contracts with subscribers? A. That is virtually the same question you asked before.

Q. Do you refuse to answer? A. I don't think I had better.

Q. Why? What reason have you to keep that secret? A. I don't know that there is anything very secret about it.

Q. It has all been published in the newspapers here in Detroit, has it not? A. Yes.

Q. Did not Mr. Pack retire from the Detroit Telephone Company? A. Yes.

Q. And did he not have such a statement in connection with it published in the newspapers? A. Yes.

Q. Replies were made to it in the newspapers? A.
984 Yes.

Q. Why do you object to telling the truth about it if it is of public notoriety here? A. Would you really like to know? Would it help you?

Q. Yes; I would like very much to know why you refuse to answer and let the court in Washington know all about this business. A. I dont' think there is any objection to it.

Q. Let us have it, then. A. The Detroit Telephone Company paid $300,000 in stock for the franchise, the subscribers, and for such telephone rights which the Construction Company was supposed to own.

Q. As a member of the board of directors of both companies, did you think that was a fair price to pay?

Mr. BIRNEY: That is objected to as incompetent, irrelevant and immaterial.

By Mr. WORTHINGTON:

Q. Or was it unfair to one of the companies, and if so which one? A. I thought it was fair.

Q. Do you think so still? A. Yes; I don't think it was unfair.

Q. What was done by the Construction Company with this large quantity of stock in the Telephone Company which it received? A. It has kept it. It is in the treasury of the company.

Q. All in the company? A. A large portion of it is in
985 the treasury of the company.

Q. What proportion of the whole? A. The majority.

Q. What was done with the rest? A. There was a stock dividend declared.

Q. How much? A. I think the stock dividend was $130,000, ten thousand dollars for each member of the board at that time.

Q. Ten thousand dollars for each member of the board? A. Yes.

Q. You got your $10,000 in stock along with the others? A. Ten thousand dollars; yes.

Q. Did you get more? A. It is in escrow, though.

Q. In escrow for what purpose? A. Because we do not want to put it on the market.

Q. Do you mean to say when you say it was in escrow that there was some arrangement among the holders that it is all to be held and not put on the market unless at a certain rate? A. No; it was to be held for a certain time, and it has always been held. It was put in escrow under an agreement that it was to be kept until a certain time in escrow. It has not been taken out.

Q. Who made that arrangement? A. The people who got it.

Q. At the time this transaction took place, of the transfer of the franchise and privileges from the Construction Com-
986 pany to the Telephone Company, were there any of the stockholders in the Telephone Company who were not stockholders in the Construction Company? A. I think not.

Q. Are you clear about that? A. Yes.

Q. Where are the stock books of the two companies now which will show who were the holders of certificates at that time? A. At the company's office.

Q. Is there any objection to our seeing those? A. I don't think we would care to have you.

Q. Why? A. I don't know any reason why I should do it. I have given you evidence about it.

Q. The books will agree with your evidence, will they? A. Yes.

Q. Then why do you object to having yourself corroborated by the books? A. I don't think we would care to have our books examined.

Q. Do you take the same position about that that you took about the books of account of the company yesterday? A. Yes.

Q. Do you still maintain that position as to all the books? A. Yes.

Q. Who was the contractor who was employed to do the first underground construction work for the independent company here in Detroit? A. The Detroit Company did
987 its own work by day work. It constructed its own plant by day work all the way through.

Q. Who superintended that construction? A. Mr. Ahern.

Q. What was the date of the transfer by the Construction Company to the Telephone Company of the franchise and privileges? A. I can't give you the date. It was very soon after the organization of the company.

Q. I understand you are positive that at that time there were no conduits constructed? A. Yes.

Q. Did the Detroit Telephone Company dispose of any of its stock to anybody except bona fide subscribers, aside from what it transferred to the Construction Company? A. I think not. I don't know of any.

Q. Did it transfer any to the company that we have called the Switchboard Company here, for brevity? A. No, sir.

Q. What has the Detroit Company actually paid here for the construction of its present plant? What did it cost you? A. I could only give you that figure in round numbers. I think it has cost us just about $600,000 in cash.

Q. And you have outstanding $600,000 in six per cent bonds? A. Yes.

Q. Then your bonds alone represent the actual amount of money that has been invested in the plant? A. Yes.

988 Q. Your stock represents nothing but water? A. That is not just the way I would put it.

Q. How would you put it? A. I would put it that neither our bonds or stock brought par. As a matter of fact, the stock and bonds were sold, but they did not bring par, and we had to use them both to get the $600,000.

Q. Just explain how that was done. How did the $600,000 of bonds get out? A. We sold them the best way we could.

Q. Did you give any of them away to people who subscribed for the stock? A. You have got the gist of that whole thing when I tell you that the stock and bonds that were sold only produced that amount of money.

Q. I would prefer to have it a little more in detail, Mr. Holmes. I want to know whether at any time when people subscribed for stock they got any bonds in addition to their stock, without any additional charge for the bonds? A. Yes; there was a time at the beginning of the thing, when some of the stock and bonds went together.

Q. How did they go together? What do you mean by that? A. The parties that bought the stock got bonds with them and the parties that bought the bonds got stock with them.

Q. How much of your stock, if any, is full paid in cash or its equivalent? A. Quite a little. I could not give you

989 just the amount.

Q. Can you approximate it? How much money have you received on stock, and how much have you received on bonds? A. I cannot give you those figures.

Q. How much money have you received in the aggregate on stocks and bonds? A. Close to the amount that I have given you there.

Q. $600,000? A. Yes.

Q. Your plant has cost you just about that sum? A. Yes, sir.

Q. Did you subscribe for any of the stock of the Telephone Company? A. Yes, sir.

Q. How much? A. I can't give you that figure.

Q. Approximately. A. I subscribed for a very large amount of it from time to time.

Q. How much, approximately? A. $25,000.

Q. Have you received all that stock? A. Yes.

Q. How much did you pay for it?

Mr. BIRNEY: Objected to as immaterial and impertinent.

A. I wouldn't answer that question.

Q. Why? A. I don't think it is necessary.

990 Q. Did you get any bonds with your stocks? Did you pay anything additional for the bonds? A. I bought stock without bonds and I bought stock with bonds.

Q. How many bonds did you get at par value? A. I can't tell you that.

Q. Can you approximate it? A. No.

Q. Do you still hold all the stocks and bonds or have you parted with any part of them? A. I hold a large amount of stock and bonds.

Q. You hold $25,000 worth? A. I hold fully that much.

Q. Is the stock which you hold stock for which you subscribed, or is it stock for which you have paid since, in part? A. No; I subscribed for it.

Q. You have not sold any of your stock, then? A. I have not sold any stock for a long time.

Q. How much did you sell? That implies that at some time you sold some of your stock. How much did you sell? A. I couldn't answer that.

Q. Can you tell me about how much? A. No.

Q. How much did you get for it?

Mr. BIRNEY: Objected to as immaterial and wholly irrelevant.

By Mr. WORTHINGTON:

991 Q. How much did you get for any of the stock which you sold? A. I decline to answer that.

Q. Has the stock had any market value here at all, fixed in any way? A. We haven't got any stock exchange here. When it sold it sold at different prices at different times.

Q. What is the range of the prices at which it sold here. A. I haven't heard of any being sold for quite a while.

Q. How long has it been since you have known of the sale of any of that stock? A. I don't know of a sale for some time.

Q. Some time is a very indefinite term. What do you mean by that? A. It has been so long that I would not know—a good many months.

Q. When it did sell, what was the range of the prices? A. The stock was transferred here at par—a good deal of it.

Q. You say it was transferred. What do you mean by that? A. Sold.

Q. Was it sold for anything less than par? A. Yes, sir.

Q. How low down was it sold? A. I don't know that.

992 Q. What was the last sale sold at that you know about? A. I don't know that.

Q. What was the rate of the last sale? A. I don't know.

Q. You know it sold below par, do you not? A. Yes.

Q. And away below, some of it? A. I don't think much of it has been sold on the market below par.

Q. Has it been sold off the market below par? A. I don't know of many sales below par.

Q. There is a market here then for stock? What do you mean by "on the market?" A. I mean transferred by private sale from one party to another.

Q. If you received for your stock and bonds $600,000 and that is what your plant has cost you, why is it you have had to apply your earnings to the extension of the plant to such an extent as to require the officers to work practically without salaries? A. When I say that we received $600,000 for stock and bonds, I speak in round numbers. I do not say we received that definitely.

Q. You mean to say now that the money you have received from stock and bonds is less than the cost of your plant? A. We may not have received quite $600,000. I don't know the exact figures. I think about that amount of money.

Q. Where would those figures appear? A. They would be on the books.

993 Q. How much stock do you now hold in the Detroit Telephone Company, Mr. Holmes? A. I hold above $25,000.

Q. How much in the bonds of that company? A. I hold above $25,000 of bonds.

Q. What proportion of your present holdings did you get in the way you have mentioned, through the Detroit Construction Company or by subscribing for stock only? A. I only got from the Detroit Construction Company $10,000 worth of stock.

Q. How much of the stock and bonds you hold did you get by subscribing for stock and bonds, without paying for the bonds? A. I can't answer that question.

Q. For the stock which you subscribed for, have you paid up in full? A. What do you mean?

Q. What is the par value of the stock? A. One hundred dollars per share.

Q. For how much of the stock which you hold and for which you paid have you paid $100 a share? A. I can't answer that.

Q. Have you paid that much for any of it, for which you subscribed? A. Yes.

Q. You cannot tell us how much? A. No.

Q. Even approximately? A. I might tell approximately.

Q. Can you tell how much you owe on your stock sub-
994 scriptions? A. I do not owe anything so far as I know.

Q. You say it is not all paid up in full? A. I do not say that.

Q. Is it all paid up in full? A. I think so.

Q. How was it paid?

Mr. BIRNEY: Objected to as immaterial and irrelevant.

Mr. WORTHINGTON: The question is repeated, as the witness has not yet answered.

Q. What is your answer, Mr. Holmes? A. I have not answered it.

Q. Will you answer it? A. No.

Q. Then it is quite apparent, Mr. Holmes, that you as a holder of the stock and bonds of this company, are interested in having it accredited as a good paying institution. The stock and bonds ought to be worth par at least. Is not that so? A. I have an interest in having as good a showing as possible.

Q. Will you tell me why it is that there has not been a share of the stock of this company sold here in Detroit for so many months? A. We have not attempted to realize any money from the sale of the stock.

Q. When you say "we" you mean— A. The company.

995 How many stockholders has the company at present?

A. I cannot answer that. I don't know.

Q. Several hundred, are there not? A. No; I don't think so.

Q. The books would show all that definitely, would they not? A. Yes.

Q. And those books you will not allow us to see? A. No.

Q. Did the Detroit Construction Company receive any bonds of the Detroit Telephone Company? A. The original deal was $250,000 of stock, $50,000 of bonds, and afterwards $50,000 of bonds were given back for $50,000 of the stock.

Q. Why was that?

Mr. BIRNEY: Objected to as utterly immaterial.

Q. Were the bonds secured by a mortgage? A. On the plant; yes.

Q. Why did the Construction Company then give up $50,000 which was secured by a first lien, and take stock which was subject to a lien of $600,000? A. They did it because they thought it was a fair deal.

Q. They thought it was an honorable thing to give back what they had acquired? A. They thought it was a good thing to make that exchange.

Q. A good thing financially or a good thing in point of morals, which? A. The directory of each company was
996 practically the same. From the Detroit Telephone Company's standpoint it seemed to be wise to have those bonds to sell.

Q. If the people interested were the same in the two companies what difference would it make which sold them? A. The people were not the same at that time. The directors were the same at the time that deal was made.

Q. The directors were the same, but the people interested as stockholders were not the same, is that what you mean? A. Yes.

Q. Then there were some stockholders of the Detroit Telephone Company who were not stockholders of the Detroit Switchboard and Construction Company A. Not at the time the original deal was made; but when the final deed was made, transferring the stock for the bonds, there were other stockholders in the Detroit Telephone Company.

Q. Was the fact that the Construction Company had received this large amount of stock and bonds from the Telephone Company made public at the time? A. I think it came out in Mr. Pack's interview.

Q. After Mr. Pack retired from the company then he published these things in the newspapers? A. Yes.

Q. In the meantime had stock of the Telephone Company been sold to people who were ignorant of that transaction? A. I don't think very much.

997 Q. But some had? A. I think so.

Q. Did you sell some of it or participate in the selling of it? A. I presume I did.

Q. Has the Detroit Construction Company at any time made a report to its stockholders of its financial transactions? A. The Construction Company?

Q. Yes. A. The Construction Company has very few stockholders.

Q. That does not answer the question. A. It has never made any report to its stockholders except as they have inquired.

Q. Has the Detroit Telephone Company made any report to its stockholders as to its financial transactions? A. No, sir.

Q. Why? A. I suppose for the same reason that the Bell people have not.

Q. What is the reason the Bell people have not? A. I don't know. I never could understand.

Q. You have personal knowledge of the transactions of your Company. You have been its president and one of its board of directors? A. Yes.

998 Q. Do I understand that you are unable to say why no report has been made to the stockholders of the financial transactions of the company? A. We have not been in existence very long; only two years. It is quite possible we will make a report this winter. I understand the Bell Company has never made a report to its stockholders.

Q. Do you understand that Judge Wilson and I are representing the Bell Company here, when you make these remarks about the Bell Compan? A. I thought you would like a little light on the general situation.

Q. Do you know anything about the affairs of the Chesapeake Telephone Company, the defendant in these suits? A. No.

Q. Do you know that for years the Board of Directors of that company has made full reports to its stockholders of every transaction connected with them? A. I do not know.

Q. You said yesterday, if I understood you, that you thought the rates which your company is receiving here for telephone service is not high enough? A. I said that; yes.

Q. It appears that the company has invested about $600,000 in its plant? A. Yes.

Q. And it has been paying six per cent. on that investment? A. Yes.

999 Q. In addition to that it has declared a dividend of two per cent. upon it at one time? A. Yes.

Q. And has had some surplus, which has been devoted to the extension of its plant? A. Yes.

Q. Why, upon that showing, do you think the rates ought to be raised? A. I think the earning power has not been very great. Even on our showing the earning power is not very great.

Q. You think six per cent. on the total investment with $32,000 additional in a couple of years, is not enough? A. No.

Q. What is your idea about what is a reasonable rate to allow such corporations, as a profit upon its investment? A. I think the stock should earn ten per cent.

Q. What is your opinion as to whether the existing plant of the Detroit Telephone Company here could be replaced at an expenditure not exceeding $500,000? A. I don't know. We

have had to spend a good deal of money here, putting in telephones that we have taken out. If you mean that we can put in five thousand telephones such as we have here now, and have cash in hand to make the cash purchases and get discounts, it might be possible to do it.

Q. Have you cash in hand to pay for what you buy? A. We have not always been flush. We have generally been hard up.

1000 Q. Why has that been when you have taken in $165,000 and your expenses have only been $97,000 for the last year? A. Our construction is getting ahead of us.

Q. Your construction has amounted to about $600,000 and you took in about $600,000 from stock and bonds, as I understand you. How is it that you are hard up if that showing is correct? A. We have been hard up all the way along. We never sold our securities as fast as we wanted to. That does not mean that we are hard up now. We have never had money as fast as we would have liked it.

Q. Have you had to borrow money at any time? A. The individuals of the company have had to borrow lots of it.

Q. Have they borrowed it for the use of the company? A. Yes.

Q. How much? A. This is getting interesting, is it not?

Q. Very. A. We borrowed a good deal of money.

Q. How much? A. I have personally borrowed as high as $15,000 or $20,000 for the company. Other directors have done as much.

Q. How much in that way has been borrowed for the company at one time? A. Possibly $60,000 or $75,000.

Q. Will you explain why it is that if you took in $600,000 and your plant cost $60,000 and your income was $165,000 for a year, while your expenses were only $97,000, you

1001 had to borrow $60,000 or $70,000 at a time to keep going. A. That is very easily explained.

Q. I would like to have it. A. We never could sell the stock and bonds just as we expected to. We had obligations to meet and these loans were made to pay construction bills while the securities were being sold.

Q. These directors, including yourself, who have assisted the company to raise the money to carry on its operations, were themselves large holders of the stock and bonds? A. Yes, sir.

Q. Had they paid in full for their stock and bonds? A. I testified that at one time, perhaps more than one time, in the early stages of our work, certain securities were sold below par; and the directors, among others, participated in that purchase.

Q. At the time you assisted the company in raising the money, borrowing it on your own personal responsibility, as I understand you, did you hold either stock or bonds for which you had not paid in full their full value? A. I presume I did.

Q. And so with the other directors? A. I think so.

Q. When was it you assisted the company in this way in raising $25,000? A. Repeatedly.

Q. How much does the company owe now of money
1002 that it has borrowed, or that its officers, or stockholders, or directors have borrowed for it? A. I think the company now owes about $60,000 or $75,000, nearly all to directors.

Q. What rate of interest is it paying for those obligations? A. Six per cent.

Q. You stated a moment ago that it is easy to explain why, although the company cost only $600,000, and it has received that amount in round numbers from its stock and bonds, although its receipts for the past year have been $165,000 and its expenses only $97,000 it still had to borrow money in these large sums to carry on its business? A. I never said that our expenses were only $97,000.

Q. What was it then that was included in the sum of $97,097.92? A. In addition to that $97,000, there was $36,000 interest.

Q. You did say that after allowing for all expenses and interest you had a net profit of $32,676.05 for the year, did you not? A. Yes; counting in $19,000 of uncollected bills.

Q. That would still leave a net profit of about $13,000, would it not? A. Yes.

Q. If you had a net profit for the year of $13,000, why is it you were borrowing $60,000 or $70,000 and paying six per cent. on it? A. We always have been borrowers ever since we started construction.

1003 Q. Why? A. For the reason I told you.

Q. How much money has the company in bank now to its credit? A. I cannot tell you.

Q. About how much? A. It has enough to pay all of its obligations that it needs to pay.

Q. About how much of it? Have you not kept yourself informed as to the balances of the company in bank? A. Not exactly. I can get it in a moment.

Q. How much is it? A. We generally carry a fair balance.

Q. About how much at present? Where do you keep your deposit? A. We keep our deposit now in the Dime Savings Bank.

Q. Can you ascertain there what the deposit is to your credit to-day? A. Yes.

Q. Would you mind going to one of your valuable telephones and finding out for us now? A. I can guess near enough.

Q. What is it? A. Is it material?

Q. I think it is very material. Otherwise I would not ask the question. A. I won't state.

Q. Why? A. I think it is prying into our affairs.

1004 Q. You have taken the stand here and voluntarily testified as to the receipts and expenditures of your company for the purpose of affecting the decision in the case in which Judge Wilson and I represent the defendant, have you not? A. If you want to put it that way.

Q. No subpoena was served upon you to require you to attend as a witness? A. No.

Q. But you agreed, after Mr. Birney had explained to you the nature of the case, and that he wished to have your testimony, to become a witness? A. Yes.

Q. Why is it under such circumstances that you will give to the court which is to decide this case information as to just such matters as you prefer to tell about and conceal the rest?

Mr. BIRNEY: Objected to as not a fair statement of the witness's position.

A. I think that I have given testimony on everything that is material that has been asked.

Mr. WORTHINGTON: Mr. Birney, I think we will have to give notice here that if this witness persists in refusing to answer this and other questions which he has declined to answer, we shall move the court to strike out his whole deposition on that ground.

Mr. BIRNEY: You may give such notice as you want.

By Mr. WORTHINGTON:

Q. Is it not a fact, Mr. Holmes, that the Detroit Telephone Company is paying to you and the other directors, or to

1005 the persons from whom you borrowed the money, interest upon it, while you yourselves hold the bonds of the company for which you have never paid and upon which the company is also paying interest? A. No; that is too strong a way to put it.

Q. What is there that is not correct about it? A. Do you mean to say we have not paid for our bonds?

Q. Yes. A. I don't know what you base your statement on.

Q. How did you pay, and what have you paid for the stock and bonds? A. Do you think the company gave us the bonds?

Q. I understand you to say that for a number of bonds you hold you simply subscribed for stock and received the bonds also without paying anything for them? Is that correct or not? I have no information on the subject except what I obtained from you while you have testified here. A. I gave you that statement.

Q. Is my statement of your testimony on that subject correct? If it is incorrect, in what particular? A. That is correct on a small portion that we secured in the early stages of the construction.

Q. Did the company during the year 1898 dispose of any of its bonds, or were they all outstanding on the first day of January, 1898? A. No; I think they were not. As a matter of fact, the company has a few bonds now unsold out of the $600,000.

Q. Did it sell any in 1898 or issue any in any way? A. None were issued. The $600,000 have been issued for some
1006 time.

Q. Did it dispose of any during that year in any way? A. I think it did.

Q. How many, and to whom? A. I cannot tell you just how many.

Q. About how many? A. I can't tell you.

Q. What did it receive for those which it did dispose of? A. I cannot tell you.

Q. Can you approximate the value which it did receive for them? A. No.

Q. Your books will show all this? A. Yes.

Q. What was done with the proceeds of the bonds which were disposed of in 1898? A. Any company bonds that were sold, of course, went into the treasury.

Q. And were used in paying its expenses? A. Its obligations.

Q. Do you know what part of its obligations they were used in paying? A. No.

Q. Do you know whether or not the money which was received from bonds sold in 1898 was spent in paying the expenses of operating and maintenance? A. They would naturally be used in paying any of the expense.

Q. Did you pay any money at all to the company for
1007 your stock which you received? A. I did.

Q. It was paid in money? A. Yes.

Q. Not in a check on your bank? A. Yes.

Q. What bank? A. I could not tell you.

Q. Can you tell how much you paid for the stock you received and how much stock you received? A. No.

Q. You could with a little investigation, could you not? A. I could by investigating; yes.

Q. Are you willing to do that? A. No; I don't think I am.

Q. Why? A. I don't think it is material.

Q. When did you pay it? A. At the time I bought it.

Q. When was that? A. There has not been any stock issued by the company for nearly two years.

Q. You cannot tell us how much you paid for the stock, and on what bank the check was drawn? A. I think it is wrong to say I cannot tell, because I can tell by investigating.

Q. But you will not? A. I don't care to; no.

1008 Q. Did you pay anything in cash to the company for the bonds which you received from them? A. Yes.

Q. How much? A. I decline to tell.

Q. Did you pay anything to the company for bonds which you received separate from stock, or did you pay for the stock and the bonds together? A. Yes, sir.

Q. How much in bonds did you receive for which you paid anything except as you got it along with the stock? A. I don't care to enter into that.

Q. Mr. Holmes, have you authorized anybody in Washington to speak for you as being willing to establish a telephone plant in the city of Washington and carry it on at the rates fixed by the recent act of Congress there? A. No, sir.

Q. Do you stand ready to do it? I believe that is the expression which has been used down there.

Mr. BIRNEY: Used where?

By Mr. WORTHINGTON:

Q. Do you stand ready to establish a telephone plant in the city of Washington to serve 2,200 to 2,500 subscribers with the best system known at rates averaging $44 per subscriber? A. You do not put the proposition in a way we would accept it. I can put it in a way we would be glad to entertain it, I think.

Q. Have you, directly or indirectly, authorized anybody to state to the authorities there that you were ready to do

1009 that? A. No, sir.

Q. You have not considered the subject seriously, have you? A. I was in Washington about eighteen months ago, soon after this bill was passed, and made some inquiries in regard to the situation, but I did not state what our company would do.

Q. During your connection with the Detroit Telephone Company, how many switchboards has it used in its main office? A. What do you mean by that?

Q. Has it had more than one? A. I haven't heard of but one.

Q. Has the manner of operation of that switchboard been changed since it was first introduced? A. I am not an electrician, and I can give you in a few words the condition regarding the switchboard. When we began the construction of our plant, we found it very difficult to get certain parts of our switchboard made. We had to farm it out, and when we got the equipment in there a certain portion of it was defective and it had to be replaced.

Q. Is that all you can say about that? A. That is all I can say.

Q. Do you know what parts were defective or what change was made? A. No; I would not undertake to explain.

Q. Do you know now what is the operation of the
1010 switchboard which is in use? A. The technical operation of it?

Q. Yes. A. No, sir.

Q. Do you know whether Mr. Ahern, your manager, is the inventor of a switchboard? A. He is.

Q. Do you use his invention? A. As far as I know, we do.

Q. As far as you know? How far do you know? Do you know what his patent or patents cover or covered? A. I know what they are supposed to cover. I am not technically versed in the art.

Q. Do you pay him anything for the use of his patent or patents? A. No, sir.

Q. I understand you to say that as far as you know there is no difference between Detroit and Washington which would affect the cost of an underground construction plant materially? A. Given the same number of telephones in operation in the two cities or the construction of a plant of the same size, I should not think there would be any material difference.

Q. Do you know what is the proportion of sheet asphalt pavement in Detroit to the whole street surface? A. No; we have a large amount of asphalt.

Q. A large amount is an exceedingly unsatisfactory term. Do you know anything about the proportion? A. Yes;
1011 I think the brick pavement is as hard, if not harder and more expensive, to take up and replace than the asphalt.

Q. Will you kindly answer my question as to the proportion of asphalt pavement to other pavement in Detroit? A. I could not give you that proportion.

Q. Could you give us that proportion in Washington? A. No, sir; I know you have a great amount of it.

Q. Can you tell us what is the average distance from your principal exchange to your subscribers' stations in Detroit? I am referring to the Detroit Telephone Company. A. The average distance?

Q. Yes. A. You mean taking our five thousand subscribers?

Q. Yes. A. They do not all come into the central exchange.

Q. I mean those who are directly connected with the exchange. That is the great bulk of them, I believe. A. I should say they would not average more than three-quarters of a mile from the central office.

Q. Is that a guess or has the matter been investigated? A. That is a judgment based on my knowledge of the situation.

Q. Do you know what is the average distance from your principal exchange of your subscribers who have telephones at the rates charged for business telephones? A. No; I could not give that except simply my judgment on it.

1012 Q. What is your best judgment? A. The average distance of the business telephones?

Q. Yes; from your main exchange. I mean those that communicate directly with that exchange, and not through a substation. A. I should say the average distance was not more than six-tenths of a mile.

Q. Do you think it is that much? A. I think it must be; yes, sir.

Q. Do you know what the average distance is from the subscribers to the exchange of the telephone company in Washington? A. I do not.

Q. Do you know the average distance there of the business subscribers? A. I should think that would depend altogether on the location of your central office.

Q. Do you know where that is? A. I do not know.

Q. What is the average distance from your central exchange of your residence telephones in Detroit? A. I presume that would average a mile and a quarter or a mile and a half.

Q. Have you ever had this investigated and figured out? A. No, I haven't had; but I think I am in a pretty good position to give a fair judgment on that.

Q. Has anybody for your company had it done and the results recorded? A. No; not that I know of.

1013 Q. You have testified that in Toronto the rate for business telephones is $45 and for residence telephones $25. Do you know whether the Bell Company in Toronto has any special rates for special instruments besides these? A. I do not; no.

Q. Do you know of your own knowledge what equipment is furnished at those rates? A. I have been in Toronto repeatedly and used the telephone and heard the common report and formed my own judgment of what is used.

Q. Partly from talking through the telephone there and partly from common report? Is that it? A. The statements of the municipal authorities.

Q. I inquired as to your personal knowledge on the subject. A. That is as far as my personal knowledge goes.

Q. I would rather have your personal knowledge as to the contents of your books and your financial transactions with this company than your hearsay evidence as to the business of the Toronto Company. Now as to the New State Telephone Company. Did it dispose of any of its stock during the year 1898? A. Yes, sir.

Q. How much? A. I should say during the year 1898 it sold $250,000 or $300,000 worth of stock—perhaps $300,000 worth.

Q. At what rate? A. At par.

Q. What is the total capital of that company? A. One million dollars.

1014 Q. How much stock has it outstanding now? A. $700,000.

Q. Of which about $250,000 was disposed of in the last year? A. About $300,000, I should say; perhaps more. I think they averaged about $30,000 a month in the sales.

Q. Was any of that stock taken by the directors? A. No, sir.

Q. It was all sold to outside parties? A. You mean purchased by the directors?

Q. Yes; that is what I mean to say. I did not mean to take it in any improper sense. A. Yes; I think some of that was taken by the directors.

Q. Then the company during the past year received from that source about $300,000? A. No, it did not.

Q. How much? A. It cost something to sell that stock.

Q. How much did it cost to sell it? A. Perhaps twenty per cent.

Q. To whom did the company pay twenty per cent, or about $60,000, for selling $300,000 worth of stock? A. To the agents who sold it?

Q. Who were they? A. Different men employed.

Q. Give us their names. A. We had a good many. We had to have a good many agents to sell that amount of stock.

Q. Name any of them that occur to you—the prin-

1015 cipal names. A. I don't care to do that.

Q. Why? A. I think that is our own business.

Q. What was done with that $240,000? A. It was put into the treasury of the company and used for construction.

Q. Were any of the directors of the company agents to sell that stock? A. Yes, sir.

Q. Some of them received this 20 per cent then? A. No.

Q. They received part of it? A. I had a contract with the company personally to sell that stock and I made arrangements with the different agents to handle it.

Q. Did you retain any part of the commission that was paid? A. I naturally retained some of it; yes.

Q. How much? A. I decline to tell.

Q. You say it was used in construction? A. Yes.

Q. Did it go into the general funds of the company and was it checked out along with money from other sources? A. Yes.

Q. Was any separation kept of money received from stock and money received from rentals? A. Separations kept

1016 where?

Q. In the place of deposit, in the first place. A. Not in the place of deposit; no. It was kept on our books.

Q. How do you know? A. Because I know.

Q. In what book of the company does that separation appear? A. In the regular books of the company.

Q. What is the name of it? A. I would not enter into that.

Q. Is it because you do not know or because you are unwilling to? A. I know it in a general way. I do not keep the books.

Q. Who is the bookkeeper, by the way, of the New State Telephone Company? A. Mr. Akin and his assistants act as auditor and bookkeepers.

Q. What is Mr. Akin's full name? A. C. J. Akin.

Q. He is over at the office of the company now, is he? A. Yes, sir.

Q. You have testified to the New State Telephone Company declaring certain dividends in 1898? A. Yes, sir.

Q. I see that the quarterly dividend of two per cent, which was declared, if I remember, on the 30th day of April, was $6,682. Is that right? A. If that is the amount, yes. I have not the figures here.

Q. And that the dividend which was paid on the 1st
1017 of August, 1898, a two per cent dividend, was $9,096?
A. Yes.

Q. Did the difference between the two dividends arise from the stock that had been sold in the meantime? A. Yes.

Q. Were these dividends declared and paid on all the stock of the company outstanding at the time the dividends were declared? A. I decline to answer that.

Q. Why? A. I don't care to.

Q. You will give no other answer? A. No.

Q. Is it not a fact that the stock which was held by you and by the other directors received no dividends, and that the dividends were made payable only to the stock which was held by outside parties? A. I don't care to answer that.

Q. Is it not a fact that that dividend was paid in that way for the purpose of influencing the price of the stock, and to lead persons who were sought to invest in the company to believe that the dividend was earned upon the whole of the stock? A. No; I think not.

Q. Why do you answer that question when you will not answer the others? A. I don't care to answer that.

Q. You have answered it, have you not? A. Yes.

Q. Do you deny that this is a fact? A. Deny that
1018 what is a fact?

Q. Do you deny that a dividend was declared payable on stock held by persons who did not know the inside secrets

of the company for the purpose of having it appear that the company was paying dividends on all of its stock which in fact it was not paying? A. I have not admitted it.

Q. I ask you if you do not admit it? A. No.

Q. Do you deny it? A. I don't deny it. I don't say anything about it.

Q. Are you willing to state why it was that a dividend was declared upon a part of the stock and not upon the rest? A. I have not said that it was.

Q. You will not even state whether that is so or not? A. No.

Q. Do you remember that when Mr. Birney was examining you as to these dividends, in this office yesterday, that I said to you, what does not appear upon the record, that the dividends were upon all the outstanding stock, and that you turned to me and said that you had not said that? Do you remember that? A. I think I do.

Q. Then you have not said they declared a dividend upon the outstanding stock, have you? A. No.

Q. Can you tell us any honest purpose that could be subserved by a corporation declaring a dividend upon a part of its stock and not upon the rest? A. I have not said it

1019 yet.

Q. No; but my question is whether that could be done for any proper purpose, and, if so, what it would be?

Mr. BIRNEY: Objected to as not calling for the statement of any fact by the witness.

Mr. WORTHINGTON: I will be glad to withdraw the question if the witness will answer the questions which relate to the facts about his company.

A. The amount of dividend paid shows exactly the amount of stock it was paid on.

Q. Very well. How much stock did the company have outstanding on the 30th day of April, 1898? A. I don't know.

Q. Approximately? A. I can't tell.

Q. Did it have stock outstanding upon which a two per cent dividend would amount to more than $6,682? A. I wouldn't say.

Q. Did it on the 1st day of August, 1898, have outstanding stock, a two per cent dividend upon which would amount to more than $9,096? A. I couldn't say.

Q. Referring to the statement which you have testified from, the New State Company had on the 31st of October a surplus of $11,001.51. Do you know where that surplus was? A. Where it was?

Q. Yes; at that time? A. In the treasury of the com-

1020 pany.

Q. On deposit anywhere? A. I wouldn't say.

Q. Where did that company keep this money on deposit? A. The State Savings Bank.

Q. Where? Here in Detroit? A. Yes.

Q. Has it had other places of deposit? A. We have places of deposit in all of the places where we do business. Every place where we have an exchange we have a bank account.

Q. Were these dividends paid by check. A. Yes.

Q. On what bank? A. The State Savings Bank.

Q. And the check stubs as well as the checks would show just to whom the money was paid? A. Yes.

Q. Your stock books for that time would show who had the stock? A. Yes.

Q. And in whose name the stock was outstanding? A. Yes.

Q. Are you willing to produce those stock books and let us get this information? A. No.

Q. How much money did the New State Company spend for new construction in 1898? A. I can only give you that in round figures from the best judgment I could form.

1021 Q. If you have any information which is at all reliable upon it, please state. I do not object to round numbers, but if it is a mere guess I would like you to state so. A. I should say we spent $300,000 in construction.

Q. Who did the work of construction? A. The Detroit Switchboard and Telephone Construction Company.

Q. That is the other company of which you are president? A. Yes.

Q. Are the stockholders of the New State Telephone Company the same as the stockholders of the Detroit Switchboard and Telephone Construction Company? A. No.

Q. The latter company has but a few stockholders, I believe? A. That is all.

Q. The stock is held by the officers and board of directors? A. Yes, sir.

Q. While the New State Company has a large number of stockholders throughout the State or the part of the State in which your system runs? A. Yes.

Q. Has it not been the practice of the New State Company to sell stock to persons in the towns where it is proposed to establish an exchange to be used in building the ex-

1022 change? A. Yes.

Q. Then the contracts with the Switchboard and Construction Company were made and authorized, I suppose, by the board of directors of the New State Company? A. Yes.

Q. And the directors were practically the same persons? A. There was some difference.

Q. The majority were the same? A. Yes, practically.

Q. The control was the same? A. Yes.

Q. So that the board of directors of the New State Company made a contract with themselves under the name of the Switchboard Company to do this construction. That is substantially it, is it not, Mr. Holmes? A. No; I don't think so.

Q. In what respect is not that a correct statement of the fact? A. They are two separate companies, organized for two different purposes.

Q. I understand that the directors did not contract with themselves individually, but they were the Switchboard Company, in fact, were they not. You have already said they held most of the stock. A. Yes.

Q. Has this been known generally to the stockholders of the New State Company? A. There is no objection to having it known.

1023 Q. Has it been known? A. It has been known to some.

Q. Has the Switchboard Company done your work at a profit? A. Yes.

Q. How many plants has it constructed under contracts made in this way? A. The whole plant of the New State Telephone Company.

Q. All the plants? A. Yes.

Q. What have been the profits of the Switchboard Company in the year 1898? A. They have not been large.

Q. What have they done with the money they made? A. They have not made a great deal.

Q. I understand you to say they did this work at a profit? A. Yes.

Q. What has become of the profit? A. The profit is principally owed by the New State Telephone Company to the Switchboard Company.

Q. Then while you have made a profit you have not been able to distribute it because the money has not been paid by the New State Company? Is that it? A. I don't know that we would have distributed it if we had.

Q. How much does the New State Company owe to the Switchboard Company? A. About $50,000.

Q. How long has it owed it? A. It has owed it right

1024 right along.

Q. Why does it not pay its debts? A. Simply because it has not had money enough.

Q. Has it not been declaring dividends, did it not declare dividends in the year 1898 amounting to over $26,000? A. Yes.

Q. Why did you declare dividends when you could not pay your debts? A. Because we paid the dividends out of the earnings of the company, not out of the sale of the stock. We pay the debts from the sale of stock.

Q. The dividends were given by check upon an institution where the money derived from sale of stock was kept in the same account, was it not? A. They were not kept in the same account in the books.

Q. They were kept in the same place in the bank and in the same account, were they not? A. They were not separated in the bank; no.

Q. Then only an examination of the books would give authentic information as to how much of the money derived from stock went to construction and whether any part of it went to dividends. Is not that so? A. Yes.

Q. Do you object to our seeing those books to ascertain whether as a matter of fact the money received from the sale of stock was not used in paying dividends? A. I state that it has not been. We would not care to have our books examined, because we consider them private property.

1025 Q. You insist that the court in Washington which is to decide this case shall take your word for it and shall not be allowed an opportunity to know what the books will show about it. Is that so? A. I do not consent to having the books examined.

Q. How much did the New State Company's plant in Ann Arbor cost? A. I should say about $35,000.

Q. When you say "I should say" what do you mean? What is your information on that subject, and how do you get it? A. I have pretty correct information on it.

Q. That is, you have information from your bookkeeper? A. Yes.

Q. How much did the plant at Pontiac cost? A. I couldn't tell you those figures except in a general way.

Q. Your books would give accurate figures on these, would they not? A. Yes.

Q. But you will not allow us to see those? A. No.

Q. The information which you have given us as to the financial results and transactions of the New State Company has been read by you from a statement prepared by the auditor of the company? A. The New State Company, do you mean?

Q. Yes. A. No; I prepared the statement from figures that he gave me.

1026 Q. Have you here the figures which he gave you from which you prepared your statement? A. Yes.

Q. Have you any objection to our seeing that? A. I have no objection to his going on the stand and verifying it.

Q. Have you any objection to our seeing it now before your cross-examination is finished? A. No.

Q. Then I would like to look at them. A. I don't think I would care to have the books examined.

Q. I am not speaking of the books, but of the statement from which you made up your statement? A. No; you can have Mr. Akin go on the stand if you wish and verify those figures.

Q. But you will not let me see the figures from which you prepared your figures? A. No.

Q. As you have stated that your testimony in relation to the financial transactions of the New State Company were taken from a writing prepared by you which was made up from another writing furnished you by the bookkeeper or auditor of the company, which is still in your possession, I now formally request you to produce that statement from which yours was made to allow counsel for the defendant to read it, before finishing your cross-examination. A. I have taken the position right through that we do not care to have our books examined, as they are private property. The auditor makes a report to me every month, and I have prepared that statement
1027 from his report.

Q. I am not now talking about the books, but about the report of the auditor from which you made your statement, which report I ask you to produce and allow us to see it. A. I do not care to.

Mr. WORTHINGTON: I again give notice that on this refusal and for the other refusals of the witness to testify, I shall move the court to suppress this entire deposition, and especially that part of it which relates to the affairs of the New State Telephone Company.

By Mr. WORTHINGTON:

Q. If I correctly noted your testimony, you have stated that the operating expenses of your Detroit Company during the first three months of 1898 amounted to $35,044.11. Is that right? A. For operating expenses?

Q. Yes. A. Yes.

Q. What items are covered by that aggregate sum? A. The entire expense of the operating room.

Q. What are they? A. Girls, chief operator—I cannot go into particulars regarding that. I am not able to.

Q. Why? A. I don't know.

Q. You only know that that is the statement that was furnished you and what it includes you do not know. Is that correct? A. Except in this general way, that it is supposed to include all operating expenses.

Q. If we want to know what the items of the operat-
1028 ing expenses are, which are included, you cannot tell us? A. I cannot tell you.

Q. You have stated also, if I have not made a mistake, that the salaries for those ten months amounted to $11,857.02. A. Yes.

Q. What salaries were those which made up that sum. A. All salaries of officers and bookkeepers, I believe.

Q. I want the statements of the different officers as to what the salaries were—everything which goes to make up that sum. A. I cannot give that to you.

Q. Does not the statement which was prepared and submitted to you and which you have here and which you have refused to produce, purport to show the financial transactions of the company for the first ten months of 1898, and an estimate of what the showing will be for November and December? A. No.

Q. It does not?

Q. Which statement do you refer to now? The statement from which you have practically read here when you gave your evidence as to the financial transactions of the Detroit Telephone Company for the year 1898. A. No.

By Mr. BIRNEY:

Q. I think that statement is in evidence, is it not? A. I think it is.

By Mr. WORTHINGTON:

Q. Do you know H. S. Pingree, who is now Governor
1029 of Michigan? A. Yes, sir.

Q. Did he call upon you for information with reference to the financial affairs of the Detroit Telephone Company and the New State Telephone Company in or about the early part of March, 1898? A. No, sir. Wait a minute. Do you mean officially as governor? I think I had a letter from Governor Pingree asking me—

Q. That is what we are talking about. A. Asking me certain things.

Q. Have you that letter? A. The one I wrote to him?

Q. No; the one he wrote to you. A. I think it is in the files; yes, sir.

Q. The files of what; of the company? A. If he wrote to me personally it is in my personal files.

Q. Did you keep a copy of your reply? A. Yes; I kept a copy of all correspondence.

Q. Will you mind letting us see that correspondence? A. Is it important?

Q. It may be and it may not be. We think it is important for us to see it and we request you to exhibit it. A. I don't think I care to exhibit. If there is anything particular to be gained by it—

Q. You decline, do you? A. I have not the slightest idea what is in the letter.

Q. The question is whether you are willing to produce it here in order that we may see what is in it and to what
1030 extent it agrees with your present declaration of the financial affairs of those companies. What do you say? A. If there is anything particular to be gained by it, I might do it.

Q. We think there is, and we request you to produce the correspondence now. A. Have you got the date of it there?

Q. I said in the early part of March, 1898. A. Why don't you read that letter. I presume it is a copy, is it not?

Mr. WILSON: That is not what we want.

Mr. WORTHINGTON: Besides, it is not a copy.

(The witness at this point sends for his clerk and directs him to see if he can find a letter written by Governor Pingree and a letter in reply thereto regarding telephone companies, in March, 1898.)

By Mr. WORTHINGTON:

Q. Did you know when you answered Governor Pingree's letter that your reply was intended to be used in affecting legislation by Congress as to telephone rates in the District of Columbia? A. The Governor is up to those kind of things.

Q. Did you know or have reason to believe at that time that that was the purpose for which he wanted a letter from you? A. I don't think it was so stated.

Q. That is not the question. The question is whether you knew. Had you not talked with him in advance and was not this matter of the correspondence arranged before the letters were written? A. I think not.

1031 Q. Are you positive about that? A. I am quite positive about that. I don't think I have ever had any talk with Governor Pingree regarding the Washington situation.

Q. What is your present opinion as to what would be remunerative rates for telephone service here in Detroit by your company? A. I gave that to you yesterday I said if we could have our rates here, what we asked for when we asked for the ordinance, $48 and $36, we would have what we consider a very fair rate.

(At this point the witness was handed by his clerk a letter press copy book.)

The WITNESS: I do not think there is any objection to your seeing this correspondence. This is a letter to the private secretary of the Governor answering a letter from the private secretary.

(Witness here produces and hands to counsel for the defendant his letter press copy of a letter from him to Mr. Bush to

which he has just referred and counsel for the defendant reads it.)

Q. Have you been able to find the letter from Mr. Bush to which this letter of yours is a reply? A. I have not.

Redirect examination.

By Mr. BIRNEY:

Q. Referring to the operations of the New State Telephone Company, Mr. Holmes, is the work of construction of
1032 that company completed? A. No, sir.

Q. Or is it in constant progress. A. It is in constant progress.

Q. That is, you are constantly erecting new lines and new stations? A. Yes.

Q. And constantly purchasing new material for that construction? A. Yes.

Q. What taxes are paid by the Detroit Telephone Company to the municipal authorities and the State authorities? A. We pay nothing to the municipal authorities except the seventy-five free telephones we give. On lieu of the municipal, state and county tax, we pay a specific tax to the State. It was 3 per cent. last year on our assessed valuation.

Q. Do you remember what was the assessed valuation? A. I say three per cent. last year, I mean 1897. Our assessed tax, I think, for 1896 was $10,000.

Q. That is the amount paid by the company? A. Yes; to the State.

Q. Do you recall what it was in 1897? A. About $7,000—slightly under $7,000.

WM. L. HOLMES,
By the Examiner by Consent.

Subscribed and sworn to before me this ——— day of ——— 1899.

Examiner in Chancery.

1033 The further taking of those depositions was thereupon adjourned subject to notice.

1034 Office of the Detroit Telephone Company,
242 Griswold Street, DETROIT, MICH.,

Saturday, *January* 14*th*, 1898, 3.30 o'clock P. M.

Met pursuant to agreement.

Present on behalf of the complainants, Mr. BIRNEY.
Present on behalf of the defendant, Mr. WILSON and Mr. WORTHINGTON.

CYRUS JAMES AKIN, a witness of lawful age, called by and on behalf of the complainants, having been first duly sworn, is examined.

By Mr. BIRNEY:

Q. What is your age, Mr. Akin? A. 39.
Q. What is your occupation? A. Auditor of the New State Telephone Company and the Detroit Telephone Company.
Q. Where do you reside? A. In Detroit.
Q. How long have you lived there? A. Eighteen years.
Q. How long have you been the auditor of the New State Telephone Company? A. Seventeen months.
Q. As auditor, what are your duties? A. To see that the outside managers make their reports correctly, to check
1035 up their reports, compile them, tabulate them, and report to the Executive Committee; looking after the operators and managers as employees; also the pay rolls and the expenses.
Q. Is it part of your duty then to compile from the reports made you from all the different officers and agents of the Company a statement of receipts and expenditures in all the exchanges? A. Yes, sir.
Q. And in each? A. Yes, sir; from each office and combined as a total.
Q. Have you, at the request of counsel for the complainants, made up a statement from the compiled statements you have just spoken of, showing the receipts and expenditures in the business of the New State Telephone Company from August, 1897, to October 31, 1898? A. Yes, sir.
Q. If you have, will you please produce it? A. This is the statement.

(Witness produces the statement in question.)

Q. What does that show? A. It shows that the gross earnings during that time—
Q. In the first column you have given the months.
Q. What appears in the first column of figures? A. The gross earnings.

Q. What appears in the second column of figures? A. The net earnings.

Q. What in the third column of figures? A. The cost of maintenance.

1036 Q. Is that third item of maintenance the difference between the two? A. Between the gross and the net; yes, sir.

Q. How far back does this statement go in its statement of the gross earnings? A. The gross earnings go back to January 1st, 1898.

(Counsel for complainants stated that he desired to offer this paper in evidence.)

The WITNESS: There is something you will need as an explanation first. From August to December, 1898, is one total amount. That is the net earnings, but it was before I had the accounts, and they were not kept in such shape that I could get at the gross earnings and maintenance, so I merely put in the total net earnings. I started the statement as net earnings only. Then I thought I would put in the others, so you could see what the maintenance was, if you wished.

Mr. WORTHINGTON: We object to this statement going in evidence unless we are to be allowed the privilege of examining the books from which it is made, and we ask counsel whether it is intended that they shall be produced, either by counsel for the complainants or at our request, which is now made.

The above-mentioned statement is offered in evidence by counsel for the complainants, and is in the words and figures following, to wit:

1037 The statement referred to was furnished by the witness to the examiner, but was lost. Mr. Birney subsequently obtained from the witness the following statement in lieu thereof:

THE NEW STATE TELEPHONE COMPANY,

242 Griswold Street,
Detroit, Mich.

Statement of gross earnings, maintenance and net earnings.

	Gross earnings.	Maintenance.	Net earnings.
May, 1897.) June,) July,)	Before my records, cannot be sure of figures at this time.		
Aug.,) Sept.,) Oct.,) Nov.,) Dec.,)			4700.54
Jan., 1898	4259.41	2362.90	1896.51
Feb., "	4356.72	2640.04	1716.68
Mar., "	4953.45	2265.01	2688.44
Apr., "	5405.98	2452.12	2953.86
May, "	6034.56	2894.47	3140.09
June, "	6019.59	2960.87	3058.72
July, "	6609.34	3288.91	3320.43
Aug., "	7315.96	2972.61	4343.35
Sept., "	7344.11	3205.58	4144.59
Oct., "	7629.91	3588.93	4040.98

1038 By Mr. BIRNEY:

Q. Have you here present the original detailed statements, part of the files of your office from which this statement was made up? A. Yes, sir.

Q. For the months shown from January, 1898, to October, 1898, both inclusive? A. Yes, sir.

Q. Will you produce them? A. Those are, office by office, the details as given in the report and the details for the month.

(The statements above referred to are now produced and handed to counsel for the defendant for their examination, being statements as follows:

Report, January, 1898, marked for identification, Exhibit "Akin 1."

Report, February, 1898, marked for identification, Exhibit "Akin No. 2."

Report, March, 1898, marked for identification, E xhibit "Akin 3."

Report, April, 1898, marked for identification, Exhibit "Akin 4."

Report, May, 1898, marked for identification, Exhibit "Akin 5."

Report, June, 1898, marked for identification, Exhibit "Akin 6."

Report, July, 1898, marked for identification, Exhibit "Akin 7."

Report, August, 1898, marked for identification, Exhibit "Akin 8."

1039 Report, September, 1898, marked for identification, Exhibit "Akin 9."

Report, October, 1898, marked for identification, Exhibit "Akin 10."

By Mr. BIRNEY:

Q. With those detailed statements before you, can you state what were the gross receipts, the expenses and the net receipts during each month from January 1st, 1898, to October 31st, 1898, both inclusive? A. Yes.

Q. Please state what were those several items in each month. You can take the papers and look at them.

Mr. WORTHINGTON: I object to that because the statements themselves are not offered in evidence, nor does it appear by whom they were made nor when, nor from what data, nor whether the witness has any personal knowledge as to facts which they purport to set forth.

The WITNESS: That is, with reference to the compiling.

By Mr. BIRNEY:

Q. Just state the figures now. State if you know this to be correct, as if you were looking at those papers. You have compared them, I believe, within the last few months.

Mr. WORTHINGTON: Before this witness undertakes to state the contents of these papers, we are entitled to know what he knows about their authenticity.

By Mr. BIRNEY:

Q. Mr. Akin, please state who made up those statements? A. From January to July, inclusive, I compiled them my-

1040 self. From that date to October 31st they were compiled by my chief clerk and checked over by myself.

Q. From what were they compiled? A. They were compiled from the original reports sent in by the managers at the different offices through the State.

Q. Do all those offices appear upon those reports? A. Yes, sir.

Q. About how many of them are there? A. Now there are about 200, but we started out with quite a few less. We started out in January, 1898, with, I should judge, about 98 offices. I can verify those figures by counting over the offices reported.

Q. What is your knowledge as to the correctness of those compilations from those reports from those different offices? A. They are found correct by comparing back with the statement itself as each statement is balanced.

Q. You have done that yourself, have you? A. Yes, sir.

Q. Will you please state from those reports the gross earnings, expenses and net earnings of each month, begining with January, 1898?

Mr. WORTHINGTON: We object because it appears that this paper is made up from certain statements which are the original entries or papers, and we call for the production of the original documents from which these papers are made up; and we ask counsel for the complainants to state whether it is intended to produce those original papers. We ask that
1041 they be produced before the examination proceed.

Mr. BIRNEY: Which counsel declines to do at this time.

Mr. WORTHINGTON: Then we will give notice that we will move to suppress this witness's testimony as to the contents of these papers and the extracts of showings made from them, because of the failure to produce the original documents and allow us to see them.

By Mr. BIRNEY:

Q. Mr. Akin, what is the volume of the papers from which these reports have been compiled? A. They would be about twenty-five document files like this (indicating).

Q. Just describe that better, if you can? A. There is an average of 130 reports.

Q. Each month? A. Each month, from January for ten months. There is the report of one office (indicating).

Q. Will you produce them for the information of counsel on the other side? A. I can do so if they wish me to.

Q. Please state the receipts, expenses and net earnings for each month from January, 1898?

Mr. WORTHINGTON: Before he goes on, it is understood, of course, that this is subject to our objection as to testimony in reference to all cities other than Washington.

Mr. BIRNEY: Certainly.

The WITNESS: This is a summary of these reports (referring to the exhibits marked for identification). Each office is on these reports and summarized, and this is the summary:

1042 January, 1898, gross, $4,259.41; expenses, $2,362.90; net, $1,896.51.

February, gross, $4,332.43; expense, $2,194.98; net, $2,137.45.

March, gross, $4,953.45; expense, $2,265.01; net, $2,688.44.
April, gross, $5,405.98; expense, $2,452.12; net, $2,953.86.
May, gross, $6,034.56; expense, $2,894.47; net, $3,140.09.
June, gross, $6,019.59; expense, $2,960.87; net, $3,058.72.
July, gross, $6,609.34; expense, $3,288.91; net, $3,320.46.
August, gross, $7,315.96; expense, $3,466.51; net, $3,849.45.
September, gross, $7,344.11; expense, $3,715.46; net, $3,628.65.
October, gross, $7,629.91; expense, $3,588.93; net, $4,040.98.

Q. Mr. Akin, before you were employed by the New State Telephone Company in your present capacity where and by whom were you employed? A. Prior to my employment here I was employed by the Michigan Telephone Company.

Q. Where? A. In Detroit, in the auditor's office.

Q. In what capacity? A. I was the accountant.

Q. When did you leave the employ of that company? A. In August, 1897.

Q. While employed by them did you have any occasion at any time to ascertain by careful examination and inves-
1043 tigation of the accounts of that company the annual cost to it of maintaining its telephones in the city of Detroit? A. Just prior to leaving there I made up a statement at the request of Mr. Forbes.

Q. Who is Mr. Forbes? A. He is the president, or was the president, before this change of the Michigan Telephone Company, and also general manager, showing the cost of maintaining and operating telephones for different offices through the State.

Q. Was the city of Detroit segregated in that statement? A. Yes, sir.

Q. What did you ascertain to be the annual cost in the city of Detroit of maintaining each telephone?

Mr. WORTHINGTON: One moment; was that statement in writing?

A. That statement was in writing, to the president, of course.

Mr. WORTHINGTON: I object to the statement of the contents of the paper unless it is produced or some excuse is shown for its non-production.

Mr. BIRNEY: I have not asked him about any paper.

The question was repeated as follows:

Q. What did you ascertain to be the annual cost in the city of Detroit of maintaining each telephone? A. It was sixteen dollars and some cents; I cannot recall the cents, ninety-four, I think; $16.94 is the way I remember it. It was $16, I know.

Q. What was included in the charges? A. The operating, the repairs and supplies necessary for repairs, as well
1044 as the labor, the rental of instruments, and the Detroit proportion of the general expenses. The general expenses were taxes, stationery, express and office help.

Q. Into what account did the salaries of officers go? A. That went into a general office expense account. Such general expense account was distributed over all the offices proportionately.

By Mr. WORTHINGTON:

Q. Proportionately to what? A. To their earnings.

Cross-examination.

By Mr. WORTHINGTON:

Q. Does the statement which you have given here for the ten months of 1898 embrace the Detroit Telephone Company? A. No, sir; it is a separate organization. It is the New State Telephone Company.

Q. Are you the auditor of the Detroit Telephone Company or connected with it at all? A. I have been recently appointed auditor.

Q. How long have you been the auditor of the Detroit Telephone Company? A. About two months.

Q. Have you here the material from which to prepare a statement as to the gross receipts, expenses and net revenue of that company as you have done for the other company? A.
1045 No, sir. Mr. W. H. Hall, the bookkeeper, has had charge of all that work.

Q. Is he under you? A. He is and he is not. That is, I have the privilege of auditing his books at any time, but he is not subject to my orders at all.

Q. So far as you know has any statement of this account been prepared with reference to that company? A. I don't know, sir.

Q. You have in your office and under your control the books of account of the New State Telephone Company? A. I don't know just how to answer that. The books were kept by the bookkeeper of the Switchboard Company for a saving of expense while the company was growing, and they just recently passed into my hands. I am working back now, auditing these reports that I have here. They have never been entered in those books, but I have got all my detail ready to check them back. That is the way it stands. I could not swear to anything that the bookkeeper has got in his books, but we have it all right in my figures.

Q. Have you any personal knowledge as to the circumstances under which any of the papers were prepared from which the reports which have been marked here for identification as Exhibits from 1 to 10 were made up? A. Any personal knowledge of how the papers were prepared?

Q. Yes. A. Yes, sir.

Q. Were you present when any of them was made? A. That is, do you mean at outside offices?

1046 Q. Yes. A. No, sir; we have got all the detail here to check them by, though.

Q. That detail is made up by whom? A. That detail is made up in my office.

Q. Made up from what? A. Do you wish me to explain how?

Q. Yes. A. For instance, every time we have a new subscriber they have got to order their material from here, and the order comes through me. They have got at the same time to send in a contract for that subscriber, showing who he is, what kind of a service he is to get, and his rate. We at once enter the contract, subscriber's name and rate, and as soon as this order is filed and the telephone is connected it is returned to us. We enter the date connected, we figure up what that subscriber should pay us every quarter. Those are added up and charged against that office. That office report is checked and it has got to agree with this. The toll business is arranged in this way: If I am Detroit office, for instance, and I talk to Pontiac, I make out and check the toll slip, and it comes to this office for compiling, showing that at such time so and so talked with Pontiac. These are brought in together every day, compiled, and the totals are compared with the Pontiac office. Then at the end of the month each office shows its business in the same way with all offices. One shows that the other received so much money and that that one should have

1047 received so much. We compare the two and they check one another. If they do not agree, we send out an error sheet and have it adjusted. Therefore, the amounts that come in these reports have got to be correct unless there is connivance between the operators.

Q. That relates to the long distance business? A. It relates to all our toll business.

Q. All the toll business? A. Yes; the exchange business, as I explained before, is by contract. For every telephone that is connected we have got to have a contract. We have got duplicate books here of what the outside exchange should have if they keep that right, and they have got to show where the difference occurs in the figures and make it right.

Q. You have not said anything about the cash received from

those companies. What check have you on that? A. It is the same check. That is, they report the outstandings. They report each month for our credits in our books the amount paid. Our outstandings and their outstandings have got to agree. They have got to give in their reports the reason why it is an outstanding.

Q. Have you here the cash book of the New State Telephone Company for the year 1898? A. No, sir, except my memorandum cash book. The general cash book was kept by that bookkeeper I spoke of.

Q. Where is he A. His name is Fox.

Q. Where is he and where is his book? A. He is with the Switchboard Company. His books are in charge of Mr.

1048 Hall, who is auditing them, working them over.

Q. What is the dintinction between the cash book of the company and your memorandum cash book? A. My memorandum cash book is not the final cash book. It gives the details you are asking about.

Q. Does it show all the entries, as to cash, both debit and credit? A. All that comes through my hands; yes, sir.

Q. Only what comes through your hands? A. That is, everything relating to reports.

Q. Does the other cash book contain other entries relating to other cash transactions which do not appear upon your memorandum book? A. I do not know of any other cash transactions.

Q. How long do you say you have been with the company? A. Nineteen months.

Q. Is the book containing the bills payable accounts of the company in your possession? A. No, sir.

Q. Where is that? A. That is in charge of Mr. Hall, who is auditing the whole set of books.

Q. It is right here in this office? A. Yes, sir.

Q. How far is it from here at the present moment? A. Two rooms.

Q. They are communicating with this, I believe? A. Yes; I could get in there, but I couldn't get in the vaults.

1049 Do you mean to say— A. I decline to take the books from the bookkeeper until they are audited, and turned over to me as correct. I do not want to depend upon myself.

Q. Is Mr. Hall there now? A. No, sir.

Q. Is somebody there in his office? A. No, sir; they close at 3 o'clock Saturday afternoons.

Q. What time did we begin this testimony? Half past three, was it not? A. Half past three or a quarter to four.

Q. I would like to see your cash book for 1898. A. I can produce it if it is so desired.

Q. It is desired and requested here and now.

(The witness produces here a cash book, which is handed to counsel for defendant, the entries in which begin January 3, 1898, and come down to date.)

Q. What is the largest office of the New State Telephone Company. A. The largest office in subscribers?

Q. Yes. A. Ann Arbor is at this date.

Q. How many subscribers has the company there now? A. I think 505, according to our last report.

Q. What is the next largest? A. Port Huron.

Q. How many subscribers have you there? A. About
1050 313.

Q. And the next? A. The next is Pontiac.

Q. How many subscribers are there there? A. I can't answer with certainty. About 287. Of course, these answers are from memory. The manager there told me the other day he was going to have 300, but I don't know whether he has got them in or not.

Q. What is the next largest office? A. Probably Mount Clemens.

Q. To go to the other extreme, at what office have you the fewest subscribers? How do they run? A. We have got lots of them with one subscriber. That is the toll subscriber.

Q. I mean exchanges. A. I think the smallest is four—Dearborn.

Q. Have you here a list of all the offices of the New State Telephone Company? A. Yes, sir.

Q. Where? A. They are in these statements you have got there as exhibits.

Q. You mean the statements which have been marked for identification? A. Yes, sir.

Q. Each one of these offices, I presume, keeps a separate set of books, showing its receipts and expenditures and the details of its payments? A. They keep a copy of the report sent in here. They balance every month. The exchanges
1051 keep a set of books with their subscribers in; but the small places are cash business.

Q. How many are there of what you call the small places? A. All except about maybe 35. There are 160 or 170 small offices, probably what you call long distance offices. They are toll stations, merely for toll service.

By Mr. WILSON:

Q. Take, for instance, this report for September, 1898. Does that contain the name of every officer? A. Yes, sir.

Q. It contains the number of telephones at each office? A. No, sir; it does not not show the number of telephones unless it is an exchange.

Q. I am talking about exchanges. A. Yes, sir.

Q. What telephones are there at these various offices other than exchange telephones? A. The exchanges all have a certain number of toll line telephones.

Q. This sheet shows all of the exchange telephones at each one of those offices, does it? A. Yes, sir.

Q. So that, for instance, I turn here to Ann Arbor. That has 356 telephones? A. 356 at that time; yes, sir.

Q. Armada has two exchange telephones? A. Yes, sir. The figures in there do not include the toll telephones in the
1052 exchange office, because every exchange has got a toll telephone.

Q. Attica has one telephone? A. Yes, sir.

Q. Belding has 41, according to this? A. Yes, sir.

Q. Birmingham 16? A. Yes, sir.

Q. City lines, 82. A. The city lines are the lines running from Detroit outside of Detroit limits and everything outside of Detroit limits belongs to the New State Company.

Q. Dearborn has three? A. Four at present. That is one of the smallest I have mentioned.

Q. Eaton Rapids 72? A. Yes, sir.

Q. Flushing 39? Yes, sir.

Q. I have gone over all, on the first page of this report. We will take Armada, which has two exchange telephones. How many toll telephones have they there, or what ever you call them? A. One.

Q. Do they have more than one at each of these places—toll telephones? A. There is probably a difference in understanding just what a toll telephone is.

Q. That is what I want to get at. A. A toll line
1053 is what we call one toll telephone. That is, there is one instrument on it. Ann Arbor, Ypsilanti, Pontiac and these other places cannot do the business on one line, so they run six, eight and ten lines, and they have got to have a place on their boards for each of these lines.

Q. I understand that. We will take Armada. How many has it? A. If it is two there it means two outside of the toll. There would be one toll.

Q. Attica has one telephone and one toll? A. One toll; yes, sir.

Q. Belding has 41 telephones. When I use the word "telephone" I mean exchange telephones. It has one toll? A. It probably has two, because the lines belong to the superintendent's department and I cannot answer how many lines there are in an office.

Q. Birmingham, with 16 telephones, would have how many tolls? A. I couldn't say. They might be able to do their business on one toll line, or they might have two lines.

Q. Would they have in excess of two? A. No; I don't think they would.

Q. What kind of an exchange do you have at Armada? A. That I would have to refer to the superintendent. I know nothing of the construction.

Q. You do not know anything about the construction? A. No, sir; I have nothing to do with construction.

Q. Do you know whether they have a switchboard there or not? A. No, sir; they have got to have some kind of
1054 switching contrivance, of course; but probably with two telephones it would be a five point or seven point switch.

Q. Do they keep an operator there? A. No, sir; except the manager.

Q. How is that conducted? A. He is paid by commission. He gets a commission on his receipts.

Q. What does that man do out there; do you know? A. At Attica?

Q. No; Armada. A. He probably keeps a general store ; I don't know. He may have a drug store or a grocery store or a postoffice or anything of that sort.

Q. We will take Belding, where there seem to be 41 exchange telephones. What kind of appliances do you have there? A. We have a switchboard there.

Q. And do you keep a switchboard operator? A. Yes, sir; and the switchboard operator is manager of the exchange and puts all of his time in at that work.

Q. What kind of construction have you there; underground or overhead? A. It is overhead.

Q. Do you know the extent of that construction? A. No, sir.

Q. Do you know anything about the cost of construction? A. No, sir.

Q. Do you know anything about the cost of maintaining it? A. The cost of maintaining I can give you. It is in these reports.

1055 Q. Do you know anything about it except from these figures that are sent to you by somebody else? A. No, sir.

Q. That is true as to all these offices? A. Yes, sir.

Q. I will take another. Eaton Rapids, 72 telephones. What kind of construction is there there? A. They have a switchboard and operator.

Q. What kind of plant have you there? A. I don't know just what that question means.

Q. It is overhead, is it? A. It is overhead. I don't think they are underground except in the larger cities.

Q. What kind of poles do you use? A. That is construction work; I don't know.

Q. Do you know anything about what the cost of the poles is? A. No, sir.

Q. What kind of wire do you use? A. That I can't say. They use different kinds of wire, but I don't know what they use in any one place.

Q. What kind of telephones are they, metallic circuit or grounded circuit, or what? A. Metallic, in almost all cases the telephones themselves are metallic—long distance systems.

Q. Do they have a return wire or wires run to them in pairs, or how? A. This metallic system consists of wires in pairs.

1056 Some of our smaller offices have got grounded circuits for a certain number of miles; but the construction people would have to say about that. I don't know anything about it. What I am giving you now is what I have understood from other folks. I told you at the start that I could not tell you anything about the construction with authority.

Q. You do not know anything about maintenance? A. Yes; I know all about maintenance. I have got that in my report here.

Q. You know that just from those figures that are in evidence? A. Yes, sir.

Q. And nothing more? A. I know the cost of maintenance.

By Mr. WORTHINGTON:

Q. I find on a cursory examination of this cash book which you have produced that the first month the entries are made under the heads "cash," "deposited," "certified deposits," and "to cashier." What is the meaning of those several headings? A. "Cash" is the receipts from those outside offices either in cash, currency, money orders or stamps.

Q. What are certified deposits or certificates of deposit? A. The certificates of deposit are a card that we furnish our manager which shows the amounts he deposits in bank on a certain date. The cashier of that bank certifies to the same account by signing the card, and that comes in here as a certificate of deposit subject to our order only at the outside bank.

Q. And the cash in the bank goes to your credit? A.

1057 Yes, sir; we call that cash, only I keep it separated so I can check it.

Q. The last column is "cashier." That seems to be an aggregate of the other two? A. That is an aggregate of the other two. This Mr. Fox I was speaking of was cashier as well as bookkeeper. I turned those amounts over to him, put the sum down on it and got a receipt from him, showing that he had received those amounts, just to protect myself.

Q. I take the month of March, 1898, for example. The total receipts for the month appear to be $2,005.25, while the gross receipts of the company's exchanges for that month, according to the tabulated statement you have read from, was $4,953.45. A. Those are the net earnings.

Q. It appears, then, that the gross receipts do not come under your cognizance at all? A. No, sir; they deduct their commission and the expenses and send the balance in here and send their vouchers for what they have expended.

Q. You asked me what the net receipts are. The net receipts for that month appear to be, according to your tabulated statement, $2,688.44, while the total cash received according to your book for that month was $2,005.25. A. There appears to be a deficiency. Is that it? I did not watch the figures.

Q. You can look at the figures yourself. I simply want to know about the discrepancy. A. It is not there more than the cash book shows. Is that it?

1058 Q. The cash book shows for the month of March under the head of "cash" $563.52, under the head of "certified deposits" $1,441.73, and under the head of "to cashier" the aggregate of those two sums, $2,005.25, while your net earnings for that month, according to your tabulated statement, amounted to $2,638.44. It appears, then, that the two ways of getting at the same thing do not agree. What is the difference? A. The difference is the outstanding.

Q. The difference is something that is not paid? A. Yes, sir.

Q. Then those tabulated statements which you have given include what is due, but is not paid? A. They include what is due. It is the earning power of the plant.

Q. That is rather an important discovery to start with. Do you know how much of the amounts you figure here as net earnings are unpaid? A. I could not tell that without going through the report.

Q. And you have not been asked to get at those amounts? A. No, sir.

Q. You come here with a statement which shows net earnings and includes sums the amount of which you do not know, which have never been received by the company? A. They have been received since.

1059 Q. You say they have all been received? A. Not the last quarter's, of course. That has not all been received because it is not due. The bills are rendered the first of the quarter, and they are payable any time during the quarter.

Q. Have you any means of making up a statement, corresponding to the one you have put in evidence here, which will show what the company actually receives and not include what it expects to get? A. We would have to deduct the outstand-

ing. We expect to get that sum, of course. We expect to get the whole earnings.

Q. Can you tell us what is the amount outstanding for each of these ten months? A. I could by going through the reports.

Q. How long would that take you? A. It would take a couple of days.

Q. Very well; we ask you to do it. Have you any objection? A. I certainly object because I would have to put in two or three days' extra work.

Q. Did you keep this cash book yourself during 1898? A. Part of the time.

Q. Is it in your handwriting? A. Partly it is. This is mine. (Indicating pages 9 and 9½, being entries from May 3rd to May 5th, 1898, as a sample.)

Q. For whom have you been doing the work of preparing the statement which has been put in evidence? A. For the president and superintendent.

1060 When did you do it? A. Each month, about the 15th of the month.

Q. I mean the statement from which you have read here to-day. A. That summary I made out this morning.

Q. At whose instance? A. Mr. Holmes asked me to be ready to answer questions, so I compiled all I thought might be all you would want. I did not know just what was wanted, nor who was to come nor anything about it.

Q. You just made a guess, and it happened to be what Mr. Birney wanted. Is that it? A. If what we have given is what he wanted. It is the same statement I make to the president and superintendent every month.

Q. Do you make a written report every month to the company showing the financial operations? A. Yes, sir; I show the number of exchanges and number of offices showing the increase each time.

Q. Please show me that report for the month of October last. A. That is what you have there. The summary on that is what I send over to them. The report itself is a detail of every office. I send them a summary of that report.

Q. I find in looking at your cash book that in October there seems to have been a change made in the method of keeping it, for, on page 26, the first entry upon which is dated October 17, 1898, I find for the first time that instead of having the column for cash and the one for deposits and one to cashier, you have a column "cash and deposits," one "stock" and another "coupons," and that this continued during October, and that

1061 in November the columns are headed respectively "cash received," "stock" and "deposits," and that form of entries seems to continue through to page 35, where the entries

are for November 30th and December 1st, 1898. The subsequent columns have no heading at all. Will you please explain that? A. The subsequent columns without headings are the same as the previous ones. In November the cash was turned over to me to take care of at that time. Prior to that time I had turned all the cash over to the cashier, and that is the reason for a stock column. We keep a separate account for stock on his receipt. Therefore I kept the memorandum of stock, that the money had been turned over to me. It was sent into this office and I turned it over to Mr. Holmes, but in the meantime I took a memorandum to know what passed through my hands, getting a voucher from him for whatever I sent.

Q. What is meant by "stock?" A. Stock sales. It has nothing to do with the expense of the company or the maintenance.

Q. I find an entry on the 18th of October, "Received on account of stock, $1,675.13." What was that? A. It is mentioned there, is it not?

Q. That is all it says about it in the book. A. October 18th?

Q. Yes. A. That is what was turned over to me by the cashier.

Q. Do you have anything to do with this money, the proceeds of stock, except to transfer it? A. No, sir.

1062 Q. Do you have anything to do with the money? A. No, sir.

Q. Who did have anything to do with it? A. Mr. Fox kept it.

Q. I understand the accounts of this company for a long time were kept in the office and by the bookkeepers of the Switchboard and Construction Company? A. Yes, sir; they were all one office at that time, in the Majestic Building. The two companies hired the one man. They did not have enough work for two men.

Q. Did they keep separate sets of books for the two companies or were they merged? A. No; they kept separate books.

Q. Where are those books now? A. Those are the books I referred to as being in the vault for audit.

Q. Which you decline to receive until they have been audited? A. Yes, sir.

Q. I find on page 28, under date of November 1st, 1898, this entry: "Detroit, W. S. Holmes," and then in the second column, under the title of "stock," $2,461.50. What does that mean? A. That is money turned over to me to work through the bank, because it was made payable to the New State Telephone Company.

Q. For you to work through the bank. What does that mean? A. It is made payable to the New State Telephone Company, and Mr. Parker, as vice-president, had to coun-

1063 tersign all checks, &c. It came into my account, and I deposited it, and then whatever was due on commission accounts or anything of that sort would be drawn from the bank. It being made payable to the New State Telephone Company, Mr. Holmes probably did not wish to have the money go through his own books only, so he sent all that over here. It is merely a transfer. The money comes over here and then goes back to his bookkeeper to issue the stock. His bookkeeper accounts in the stock book for all receipts, and the stock certificates show what ought to be received. The books have got to balance, of course.

Q. What does the word "Detroit" indicate in that entry? A. Detroit is the place. You will notice I have the different places at which money is received. That is merely to enable me to check up my reports in case I want to look back any time.

Q. Does that indicate that this was an individual transaction of Mr. Holmes? A. I don't know anything about what the transaction is. It was turned over to me as moneys received on the stock.

Q. And whose stock was sold or to whom the money would ultimately go you did not know? A. No, sir; I did not know.

Q. On page 32, under date of November 14, 1898, there is a similar entry, "Detroit, William L. Holmes, $2,000." Was that a similar transaction? A. Yes, sir.

1064 Q. I find on the same page, under date of November 15th, 1898, "Detroit, William L. Holmes, $4,500," under the head of stock. A. It is a similar transaction; yes, sir. He may have been buying stock himself or anything else, so far as I know.

Q. I find on page 32, under date of November 15th, on the credit side, "Det. Sb. & Tel. Con. Co., $7,000." What does that mean? A. That is a voucher paid to the Detroit Switchboard Telephone and Construction Company.

Q. Do you know what that was paid for? A. It was paid for construction work, but I do not know what it would cover. That was paid on order from the president.

Q. Did that Company do pretty much all the construction work of the New State Telephone Company? A. Yes; they have secured pretty nearly all the contracts.

Q. Do you know how they secured them? A. They secured them by making an estimate of what the work would cost. We tell what we want built, and they submit estimates.

Q. The two companies have the same officers and the same board of directors? A. The same president; that is all.

Q. They did not have the same board of directors at all? A. I don't know about the board of directors, who their board of directors are, but so far as the officers are concerned, Mr. Holmes is president of the three companies.

1065 Did he sign the contracts on behalf of both companies? A. I don't know. I presume Mr. Ahern, the general superintendent, signed the contracts.

Q. He signed them for the Detroit Company. Who signed them for the New State Company? A. He was general superintendent of the New State Company at that time.

Q. They had the same superintendent for both companies? A. Yes. sir.

Q. Did he sign for both companies? A. He used to sign for both companies. I don't know what he did with the Detroit Company.

Q. Do you have anything to do with the keeping of the minutes of these two companies? A. No, sir.

Q. Do you know whether they keep minutes? A. No, sir.

Q. You never happened to see a book of minutes? A. Mr. Flowers is secretary. I presume he would have charge of that.

Q. I find on page 33, under date of November 18th, this entry: "Detroit, William L. Holmes, $7,500," like other similar entries on the debit side of the account. What does that indicate? A. It indicates cash received from W. L. Holmes, or a check.

Q. And on the same page, under date of November 21st, a similar entry: "Detroit, William L. Holmes, $2,000." It is the same thing, is it? A. Yes, sir; it is stock sales. They
1066 were coming in pretty thick just then.

Q. I find on page 34, under date of November 25th another entry, simply "William L. Holmes," and under the head of stock, $3,000. A. That is a similar entry, and I presume the clerk in entering it has omitted to put "Detroit" because she knew where Mr. Holmes is, and supposed everybody else did. Of course, we know.

Q. On page 31, under date of December 1st, I find: "W. L. Holmes, $1,705.50" under the head of stock. That is another one of these transactions, is it? A. Yes, sir.

Q. I find the following entries on the credit side of the cash book, on page 34:

November 22, 1898, Det. Sb. and C. Con. Co., $4,000.

Page 35, December 1st, 1898, Det. Sb. and T. C. Co., $5,000.

Same page, December 7th, Det. Sb. and T. C. Co., $3,000.

Same page, December 13th, Det. Sb. and T. C. Co., $5,000.

Page 36, December 22nd, 1898, Det. Sb. & Tel. Con. Co., $2,500.

What do these several entries represent? A. Payments made to the Detroit Switchboard and Telephone Construction Company for work performed as per order of the president.

Q. I wish you would look through those pages to which I have just referred, pages 35 and 36, covering five pages, the

pages being double, and tell me what is the largest item you find to the credit of cash, aside from those I have read,
1067 referring to the Detroit Switchboard and Telephone Construction Company. A. $300 is the largest.

Q. When the New State Company obtains money by borrowing it does that appear on this book? A. No, sir; I have never known them to borrow any.

Q. If they borrowed it, would it properly appear on this book? A. Yes, sir.

Q. This book shows, then, all their cash receipts? A. It shows all the cash transactions from the date it starts there.

Q. Have you not just told us that as to the various exchanges it shows only the net receipts and not the gross receipts? A. That is not gross receipts; that is cash receipts.

Q. Then the cash received by any of these exchanges figures in your book? A. No, sir; not unless it is received by us.

Q. These local organizations are not independent companies, are they? A. No, sir.

Q. The New State Telephone Company employs and pays all the various persons who construct and operate the various exchanges? A. Not construction.

Q. Construction is under the Switchboard Company? A. The construction is under the Switchboard Company—well, whoever gets it on estimates. The construction is on
1068 an estimate, and whoever gets that, it of course is paid.

Q. Does not the Switchboard Construction and Telephone Company practically get it all? A. They get the major part of it, I will say.

Q. What do you mean by that? A. The larger part.

Q. Do they not get nine-tenths of it? A. I can't say.

Q. You will not say they do not? A. No; I will not say they do not, nor that they do. I don't know what they get.

Q. Have you anything which will show? A. No, sir; all I can show is what we order from them.

Q. You mean if you order from anybody else it does appear? A. If it is ordered by the executive. I do not order from anybody else. That is, our general supplies are contracted for by that company, which come to small amounts right straight along.

Q. Do you know personally their buying anything from any other source that they can get from them? A. Yes.

Q. What? A. I have bought gloves and tools and one thing and another right in the city here that I didn't send on to them for. I paid more for them, but we wanted them in a hurry.

Q. Have you any book or memorandum which will show the financial transactions between the two companies? A.

1069 No, sir; all I know is what I order myself, and it is only recently it has passed through my hands. It belongs to the superintendent. That is, while he was in New Orleans I had the orders coming in here.

Q. Have you anything to show how much the New State Telephone Company owes to the Switchboard and Construction Company now? A. No; that is, in these general books.

Q. That you have nothing to do with? A. I have nothing to do with that.

Q. But Mr. Hall has? A. Mr. Hall could not answer that, because they have not rendered a statement for the last couple of months.

Q. Who has not? A. The Switchboard Company.

Q. Does not your company keep its books so that it will know how much it owes to people without having to be informed by them? A. Not unless they send in the bill.

Q. You only know how much you owe them by their informing you of the fact? A. They send the details, and I check it, of course, just the same as I do any other invoice.

Q. Are the entries in this cash book that you have produced carried into any other book—posted into a ledger or any other book? A. No, sir; they have not been for the same reason. I was waiting for the book to be audited, and then I would go ahead and make my entries.

1070 Q. How long have you been waiting in that way to get the books in which these ought to be posted? A. The books were sent up here about three weeks ago.

Q. This book begins the first of January, 1898. A. That was merely in self-protection to show what cash I handled; and I have the cashier's receipt for the money turned over to him.

Q. It was not intended that the entries during that period should be posted in any other book? A. No; he has the detail of that.

Q. Who has? A. The cashier.

Q. What is his name? A. Fox. I sent it to him and got his receipt to show that I turned over all the money I received.

Q. Have you any personal knowledge as to what expenses go into the expense account of these various exchanges? A. Into our expenses—yes, sir.

Q. I am not speaking of "our expenses." A. The expenses of the company.

Q. The expenses of these local exchanges. A. That is, for all the company? I speak of it as one company. Yes, sir; I know all the details of their expenses.

Q. What are the items which are included in the expense account? A. The commissions of operating, when it is commissions, or salaries, the express and freight and repair work, both labor and material, rent, light and heat.

1071 Q. Anything else? A. Any incidental that might come up that way—water and their proportion of the office expenses; their portion of the general expenses, you might say; office expenses, taxes, stationery, etc.

Q. Have you finished? A. I think that is all.

Q. What are the general expenses which are distributed among the local exchanges? A. Just what I stated, the office expenses, general stationery, general freight, taxes.

Q. Salaries? A. Salaries are what are called the office expenses.

Q. What are the salaries of the general officers of the company? A. The amounts?

Q. Yes; and the names of the offices. A. That I cannot give you.

Q. Who is president? A. Mr. W. L. Holmes.

Q. What is his salary? A. I don't know.

Q. Do you know whether he receives any? A. I do not know.

Q. Have you ever known him to receive any? A. Yes; I have known him to receive, as far as my knowledge goes, $100.

Q. When was that? A. That was two months ago, and the month before that, $50 on each occasion for service.

1072 Q. For service? A. Yes, sir.

Q. For some special service or on account of salary? A. No; general service.

Q. What do you mean by general service? Can we not find out whether the officers of this company receive salaries as officers of other companies do? A. I don't know whether they receive salaries. I was asked by the finance people, that is, Mr. Parker, Mr. Holmes and Mr. Ahern, to make out the check for $50 for Mr. Holmes on two separate occasions, a month apart, for his services to the New State Telephone Company.

Q. But prior to that had you been making out any checks for him? A. No, sir.

Q. What can you tell us about any other officer receiving salary? A. No, sir; there is no other officer who has been paid anything since I have handled the cash. You understand, I looked over these disbursements of cash about three months ago. That is where these credits appear in the cash books.

Q. If there have been salaries paid to officers, have you anything within your reach to show what has been paid, and to whom? A. No, sir; the general books would have to show that.

Q. The same general books that are out of your dominion? A. That is naturally where all these entries are in the gen-

1073 eral books.

Q. Is there any objection, so far as you know, to an expert accountant coming here at our expense to examine the papers which are so numerous and from which your

statement which has been put in evidence has been compiled? A. That would have to be the say of the President or the executive committee.

Q. The president is Mr. Holmes. Who are the executive committee? A. The executive committee, as I understand it, are Mr. Holmes, Mr. McLeod and Mr. Parker.

Q. Is either of them near here now? A. Mr. McLeod has his office at 330 Lafayette Street. Mr. Parker has an office the third room from here, but I don't know whether he is here this afternoon or not. He was not here this morning.

Q. Will you have any objection to inquiring whether he is here and finding out whether we can have such permission? A. Yes, sir.

(The witness at this point left the room and subsequently returned.)

The WITNESS: His office is closed.

Q. Did I understand you to say a little while ago, Mr. Akin, that in order to ascertain how much was outstanding and uncollected from these exchanges, you would have to go over a number of books and take two or three days? A. Yes, sir.

Q. I have here the statement which was marked for identification Exhibit "Akin 10," being a compiled report for
1074 October, 1898, and I find it like the other exhibits marked for identification from 1 to 10 to have a column headed "outstanding." What does that mean? A. Probably Mr. Holmes asked for detail of outstanding that month.

Q. I find the same thing in the one for September, 1898, being Exhibit 9. A. Once or twice Mr. Holmes wanted roughly what was outstanding, but I would not vouch for those outstandings being absolutely correct, without going right through the reports. That is merely a memorandum handed to him as an approximation.

Q. Please look at this exhibit, "Akin, No. 4," being the consolidated report for April, 1898, and state whether it does not show under the head of uncollected rentals $6,587.98? A. Yes, sir.

Q. Please look at the consolidated report for May, 1898, Exhibit "Akin, 8," and tell me whether that does not show under the same heading, uncollected rentals, $3,807.39? A. $3,807.39.

Q. Please look at Exhibit "Akin, 8," and state whether it does not show under the head of outstanding $11,907.25? A. $11,907.25.

Q. Please look at the report for September, Exhibit "Akin, 9," and tell me whether that does not show outstanding $7,457.47? A. $7,457.47.

Q. Please look at the report for October, 1898, Exhibit 10,

and state whether that does not show under the head of
1075 outstanding $16,785.22? A. $16,785,22.

Q. Will you tell me how the amount for October comes to be greatly in excess of any previous month. A. In October there was charged up the rentals for the quarter, the three months, and they are not due until the middle of November.

Q. Is there any objection to our putting in evidence one of these original reports as a sample of the others? A. No; there is no objection to putting it in evidence. Of course, we do not want to lose the record.

Q. You want the original kept here? A. Yes, sir.

Q. You decline to allow us to take it away? A. Yes, sir.

Mr. WORTHINGTON: That being so, we offer in evidence a copy of this statement for October, 1898; and, by consent of counsel, the examiner here copies it into the record, as follows:

Earnings.			No. of Phones.	Gross Earnings.	Mtce.	Net Earnings.	Pay Rolls & Commission.			Rent, Light, Heat.	½ rent ch'g'ed outstanding.
Toll.	Rental.						Toll.	Rental.	Miscl.		
9.20		Ada		9.20	1.50	7.70	1.38		.12		
46.70		Adrian		46.70	18.27	28.43	sw 4.88		.26		
21.90		Algonac		21.90	3.34	18.56	3.28		.06		
13.30		Almont		13.30	2.	11.30	2.				
1.70		Alto		1.70	.24	1.46	.24				
2.60		Amadore		2.60	.29	2.21	.39				
		Anchorville									
		Anderson								L 6.89	2665.13 Rent.
100.61	648.20	Ann Arbor		748.81	207.69	547.12	65.	126.	.80	H 3.	100.61 Toll.
25.75	2.25	Armada	2	28.00	4.36	23.64	3.86	.34	.16		
1.40		Atkins		1.40	.21	1.19	.21				
1.65		Argentine		1.65	.45	1.20	.25		.20		
9.80	1.50	Attica	1	11.30	1.71	9.59	1.47	.22	.02		3.50 Rent.
6.85		Avoca		6.85	1.05	5.80	1.03		.02		
.90		Biddow		.90	.13	.77	.13				
18.30	39.50	Belding	43	57.60	59.70	1.90	12.	26.	6.70	R 15.	16.50 Rent.
7.85		Belleville		7.85	1.18	6.67	1.16				
27.79	18.	Birmingham	13	45.79	8.15	37.64	4.20	2.70	1.25		10.25 Toll.
3.15		Blaine		3.15	.47	2.68	.47				89.34 Rent.
11.90		Blissfield		11.90	1.95	9.95	1.95				
1.40		Brest		1.40	.24	1.16	.14	.10			
22.05		Brighton		22.05	3.49	18.56	3.31		.16		
2.25		Britton		2.25	.34	1.91	.34				
1077											
1.80		Brockway		1.80	.32	1.48	.27		.05		
8.45		Byron		8.45	1.33	7.12	1.27		.06		
4.		Bancroft		4.	.60	3.40	.60				
3.40		Cady		3.40	.61	2.79	.51		.10		
11.60		Clifford		11.60	1.90	9.70	1.74		.16		

7.90		Clinton		7.90	1.31	6.59	1.31				
1.15		Colerain		1.15	.17	.98	.17				
2.10		Cascade		2.10	.44	1.66	.32		.12		
.50		Cascade Springs		.50	.15	.35	.07		.08		
1.00		Chesterfield		1.00	.15	.85	.15				
14.25		Clarkston		14.25	2.50	11.75	2.13		.37		
12.		Clarksville		12.	1.92	10.08	1.80		.12		
12.63		Croswell		12.60	3.49	9.11	1.99			1.50	
	152.47	City Lines	84	152.47		152.47					443.61 Rent.
3.10		Columbiaville E. S.		3.10	.52	2.58	.46		.06		
9.65		Columbiaville W. S.		9.65	1.44	8.21	1.44				
6.75		Corunna		6.75	1.	5.75	1.				
4.75		Davis		4.75	.71	4.04	.71				
8.25		Davisburg		8.25	1.40	6.85	1.27		.13		
9.	5.	Dearborn	3	14.	2.10	11.90	1.35	.75			14.50 Rent.
2.10		Denton		2.10	.42	1.68	.42				
75.10	Msgs										
662.84		Detroit		737.94	217.96	519.98	166.13	51.83			3007.33 Toll.
10.70		Davison		10.70	2.61	8.09	1.61	1.			
5.80		Disco		5.80	.93	4.87	.87		.06		
2.10		Drayton Plains		2.10	.36	1.74	.32		.04		
20 70		Dryden		20.70	3.11	17.59	3.11				
14.30		Dundee		14.30	2.25	12.05	2.15		.10		
13.65		Deerfield		13.65	2.24	11.41	2.24				
1078											
15.25		Durand		15.25	7.45	7.80	2.29	13.92	5.16		
14.90	92.83	Eaton Rapids	74	107.73	49.	58.73	2.23	22.15	10.70		122.50 Rent.
3.00		Ecorse		3.	.45	2.55	.45				
1.		Elmdale		1.	.28	.72	.15		.13		
3.70		Emmett		3.70	.74	2.96	.56		.18		
1.85		Elba		1.85	.28	1.57	.28				
4.35		Fargo		4.35	.65	3.70	.65				
.35		Fair Haven		.35	.10	.25	.05		.05		
10.75		Farmington		10.75	1.61	9.14	1.61				
32.35		Fenton		32.35	5.01	27.34	4.86		.15		
		Flat Rock						6.75			
	45.	Flushing	39	45.	20.03	24.97		13.28			179. Rent.
		Fowler									
14.22		Fowlerville		14.22	2.33	11.39	2.13		.20		

30688

OCTOBER—Continued.

Earnings.								Pay Rolls & Commission.			Rent Light Heat.	¼ rent ch'g'd outstanding.
Toll.	Rental.		No. of Phones.	Gross Earnings.	Mtce.	Net Earnings.	Toll.	Rental.	Miscl.		
2.20		Franklin		2.20	.35	1.85	.33		.02		
2.40		Fraser		2.40	.56	1.94	.36		.20		
9.25		Freeport		9.25	1.53	7.72	1.39		.14		
3.30		Fostoria		3.30	.69	2.61	.49		.20		
.30		Gardendale		.30	.15	.15	.05		.10		
2.50		Gibraltar		2.50	.50	2.	.38		.12		
35.44	78.15	Grand Ledge	61	113.59	53.41	60.10	22.08	27.63	3.70		35.44 Toll. 394.09 Rent.
83.85		Grand Rapids		83.85	29.96	62.89	20.96				
1.90		Grape		1.90	.29	1.61	.29				
2.35		Green Oak		2.35	.42	1.93	.35		.07		
28.38	72.42	Greenville	77	100.72	54.11	46.61	13. 4.25	26. 10.86			102.91 Rent.
1.20		Gregory		1.20	.18	1.02	.18				
6.75		Haward		6.75	1.67	5.08	1.35		.32		
4.35		Hartland		4.35	.65	3.70	.65				
8.		Hadley		8.	1.46	6.54	1.20		.26		
1079											
		Hamburg									
10.70		Hastings		10.70	1.61	9.09	1.61				
		Highland Park									
30.35		Holly		30.35	6.07	24.28	4.57 5.05		1.50		23.30 Toll.
33.65	46.50	Howell	39	80.15	25.96	54.19	9.50	10.	1.41		84.00 Rent.
.25		Hoytville		.25	.06	.19	.04		.02		
		Hubbardston									
1.95		Hunter's Creek		1.95	.35	1.60	.29		.06		
3.25		Ida		3.25	.51	2.74	.49		.02		
40.20	34.	Imlay City	29	74.20	24.90	49.30	6.03	16.58	2.30		102.00 Rent.
75.30	216.83	Ionia	129	292.13	146.60	145.53	53.50	78.00	13.10	L 2.	670.25 Rent.

1.20		Iosco		1.20	.68	.52	.18		.50			
7.50		Jeddo		7.50	1.25	6.25	1.12		.13			
3.80		King's Mills		3.80	.57	3.23	.57					
2.95		Lakeville		2.95	.54	2·41	.44		.10			
26 30		Lake Odessa		26.30	27.40	*1.10	25.		2.48			
64.50		Lansing		64.50	16.13	48.37	16.13					
							2.60			R 19.67		
80.25	164.65	La Peer	135	244.90	149.42	95.48	12.18	24.70	87.37	H 1.90	71.20 Toll.	
											524.78 Rent.	
		Lenox										
14.30		Leonard		14.30	2.15	12.15	2.15					
		Leslie										
10.95		Lexington		10.95	1.71	9.24	1.65		.06			
21.75		Lowell		21.75	3 41	18.34	3.26		.15			
9.20		Lum		9.20	1.47	7.73	1.47					
7.95		Lyons		7.95	2.29	5.66	1.19		1.10			
9.20		Linden		9.20	1.50	7.70	1.38		.12			
16.20		Marlett		16.20	2.60	13.60	2.43		.17			
5.65		Macomb		5.65	.84	4.81	.84					
		Manchester										
1080												
67.62		Marine City		67.62	31.	36.62	16.90		14.10			
		Mason										
9.45		Maybee		9.45	1.42	8.03	1.42					
2.65		McCords		2.65	.49	2.16	.40		.09			
16.20	2.	Memphis	1	18.20	2.83	15.37	2.43	.30	.10			
16.25		Metamora		16.25	2.44	13.81	2.44				12.· Rent.	
7.		Mulliken		7.	1.09	5.91	1.05		.04			
68.93	256.58	Monroe	141	325.51	93.74	231.77	6.96	38.49	48.29		87.56 Toll.	
											686.75 Rent.	
.20		Morgan		.20	.05	.15	.03		.02			
11.80		Morrice		11.80	1.77	10.03	1.77					
								20.50	47.20	R 42.	306.47 Toll.	
139.64	288.45	Mt. Clemens	189	428.09	286.16	141.93	63.30	100.00		L 1.25	1274.23 Rent.	
										H 5.91		
2.65		Muir		2.65	.80	1.85	.40		.40			
		Munith										
		New St. Tel. Co							323.72			
3.05		Nashville		3.05	.48	2.57	.46		.02			

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OCTOBER—Continued.

Earnings.			No. of Phones.	Gross Earnings.	Mtce.	Net Earnings.	Pay Rolls & Commission.			Rent, Light, Heat.	½ rent ch'g'd outstanding.
Toll.	Rental.						Toll.	Rental.	Miscl.		
10.45		New Baltimore.....		10.45	1.57	8.88	1.57				
		New Boston.....									
12.80	5.	New Haven.....	3	17.80	2.57	15.23	1.82	.75			
20.35	19.	North Branch.....	16	39.35	6.79	32.56	3.05	2.85	.89		35. Rent.
1.85		North Street.....		1.85	1.35	.50	1.35				54.50 Rent.
33.47	18.	Northville.....	12	57.47	8.42	43.05	5.02	2.70	.70		
5.76		Novi.....		5.76	.86	4.90	.86				16. Rent.
.90		Oakfield Centre.....		.90	.15	.75	.13		.02		
.10		O'Donnells.....		.10	.02	.08	.02				
9.		Old Port.....		9.	1.35	7.65	1.35				
1.65		Oak Grove.....		1.65	.25	1.40	.25				
16.30	4.	Orion.....	2	20.30	3.54	16.76	2.45	.60	.49		
1081											
38.70		Owosso.....		36.70	9.67	29.03	9.67				
7.65	2.50	Other Lake.....	2	10.15	1.52	3.63	1.15	.37			
74.30		Oxford.....		74.30	17.14	57.16	17.14				
5.40		Orleans.....		5.40	4.59		.81				
1.05		Otis Co.....		1.05	.21	.84	.15		.06		
5.05		Otisville.....		5.05	.75	4.30	.75				
.20		Pearl Beach.....		.20	.05	.15	.03		.02		
6.75		Perrinsville.....		6.75	1.	5.75	1.				
12.45		Perry.....		12.45	1.37	10.58	1.87				
16.40		Petersburgh.....		16.40	2.50	13.90	2.46		.04		
1.20		Pewamo.....		1.20	.27	.93	.27				
		Pikes Peak.....									
1.		Pinckney.....		1.	.55	.45	.15		.40		
1.20		Plainfield.....		1.20	.88	.32	.18		.70		
							6.35	4.50			99. Rent.
42.33	30.	Plymouth.....	19	72.33	27.89	44.44	8.	8.	1.04		141.56 Toll.
								3.			936.33 Rent.

146.56	362.	Pontiac		508.56	236.95	271.61	90.	100.	43.95			
104.82	461.36	Port Huron		566.18	443.91	122.27	105.	165.70	123.95	R 39. L 66.58 H 3.68	158.40 Toll. 1773.75 Rent.	
1.55		Parshallville		1.55	.23	1.32	.23					
.10		Quimby		.10	.02	.08	.02					
4.25		Ridgeway		4.25	.69	3.56	.64		.05			
37.82	17.33	Richmond	7	54.65	8.23	46.42	5.63	2.60			70. Rent.	
42.45	2.	Rochester	1	44.45	7.28	37.17	6.36	.30	.62			
3.50		Rockwood		3.50	.61	2.89	.53	.08				
							6.15	8.28				
41.	55.20	Romeo	36	96.20	30.78	65.42	5.	10.	1.35		175.64 Rent.	
		Roseville										
											34.50 Toll.	
8.93	364.	Sault Ste. Marie	211	372.95	190.37	182.52	5.90	139.	40.97	R 12.50	817.61 Rent.	
7.82	2.50	Salem	2	10.32	1.73	8.59	1.17	.38	.18			
27.90	33.	Sand Hill	40	60.90	20.	40.90	10.	10.			99. Rent.	
1082												
21.10		Saranac		21.10	3.22	17.88	3.16	.06				
3.50		Sheldon, Canton P.O.		3.50	.53	2.97	.53					
		Smith's Creek										
10.25		South Lyon		10.25	1.67	8.58	1.54	.13				
4.25		South Rockwood		4.25	.32	3.93	.32					
							7.40	11.65				
44.39	77.72	St. Clair	55	122.11	41.48	80.63	7.71	10.	4.72		45.56 Toll. 99.19 Rent.	
		Stockbridge										
7.90		Sunfield		7.90	1.55	6.35	1.18		.37			
7.90		Silverwood		7.90	1.23	6.67	1.19		.04			
1.05		Smyrna		1.05	16.00	.89	.16					
.40		Sutton		.40	.06	.34	.06					
25.10		Tecumseh		25.10	6.37	18.73	6.27		.10			
11.15		Thomas		11.15	1.75	9.40	1.67		.08			
		Thornapple Lake										
15.85	15.50	Trenton	9	31.33	12.	19.35	8.	4.			9. Rent.	
.50		Unadilla		.50	.07	.43	.07					
37.40	25.33	Utica	24	56.73	21.01	35.72	4.71	3.80	12.50		52.	
		Utica Junction										
4.40		Vernon		4.40	.93	3.47	.66		.27			

306900

OCTOBER—Continued.

Earnings.			No. of Phones.	Gross Earnings.	Mtce.	Net Earnings.	Pay Rolls & Commission.			Rent, Light, Heat.	½ rent ch'g'ed outstanding.
Toll.	Rental.						Toll.	Rental.	Miscl.		
2.70		Waldenburg		2.70	.40	2.30	.40				
		Waltz Station									
11.16	1.50	Warren	1	12.66	2.15	10.51	1.69	.22	.24		
6.26		Washington		6.26	.98	5.28	.94		.04		
6 95		Waterford		6.95	1.04	3.91	1.04				
24.33		Wayne		24.33	3.64	20.69	3.64				
5.75		Webberville		5.75	.89	4.86	.89				
		Whittmore Lake									
18.65		Williamston		18.65	2.89	15.76	2.79		.10		
1.60		Woods Corners		1.60	.24	1.36	.24				
1033											
		Wixom									
3.90		Woodbury		3.90	.92	2.98	.58		.34		
8.50		Woodland		8.50	1.37	7.13	1.28		.06		
							9.30	R13.15			
70.70	87.66	Wyandotte	47	158.36	59.75	98.61	9.84	10.			
							10.	6.68L	.78		57.30 Toll.
10.35		Yale		10.35	8.50	1.85	8.50				256.74 Rent.
							5.07R		R2.20		84.06 Toll.
74.	312.32	Ypsilanti		386.32	292.02	94.30	54.	88.	58.10 R	11.66	743.83 Rent.
3569.69	4060.27			7629.96	3127.87	4505.09	1108.91	1232.68	607.74 323 72	178.64	16,785.22

By Mr. WORTHINGTON:

1084 Q. I notice in these reports there is occasionally an entry in red ink. What does that mean? A. It means that for that month we paid out more than we received.

Counsel for the defendant here state that they are through with the cross-examination of this witness in so far as they can proceed with it at the present time, but that they are unable to complete it until they shall have made an examination by an expert accountant of the voluminous original papers from which the compiled statements and the witness's synopsis of the compiled statements put in evidence have been made up; and they ask for an adjournment of the examination of this witness for that purpose.

Mr. BIRNEY: Since neither the complainants nor their counsel nor the counsel for the defendant have any authority or power to direct an expert examination of the papers referred to, counsel for complainants objects to any postponement and insists that the cross-examination proceed.

Mr. WORTHINGTON: We will not proceed further at this time, and our remedy if this is insisted upon will be with the Court.

Redirect examination.

By Mr. BIRNEY:

Q. Mr. Akin, is the rate of charge at the exchanges of the New State Telephone Company uniform at all the exchanges. A. No, sir.

1085 Q. How do the charges vary? A. The general charge is $24 for business and $18 for residences on a single line. There are a few exchanges I think, in Belding and Greenvale, which were purchased from a party who built the exchange, and the rates, though authorized by franchise, were not held to. He made lower rates, but at Belding—

Q. Never mind—they are lower? A. Yes.

Q. They are not higher than the amounts you have named? A. No, sir; no rates higher than $24 and $18.

Mr. WORTHINGTON: Counsel for defendant state that they wish to reserve the right, if they return to Detroit, to take testimony, to further cross-examine Mr. Akin as to his statement of the cost per telephone in the Michigan Telephone Company.

CYRUS J. AKIN,
By the Examiner by Consent.

Subscribed and sworn to before me the ——— day of ——— 1899.

Examiner in Chancery.

The further taking of these depositions was thereupon adjourned, subject to notice.

1086 Office of the Western Telephone Construction Co.

250-4 South Clinton Street, CHICAGO, ILL.,

January 16*th*, 1899, 11 o'clock A. M.

Met pursuant to agreement. Present:

On behalf of the complainants, Mr. BIRNEY.
On behalf of the defendant, Mr. WILSON and Mr. WORTHINGTON.

At the request of Mr. Birney the presence of Mr. Isaiah W. Farnham was also noted.

STANLEY A. DUVALL, a witness of lawful age, called by and on behalf of the complainants, having been first duly sworn, is examined.

By Mr. BIRNEY:

Q. Where do you reside? A. I am residing at present in Chicago.

Q. By whom are you employed, and what is your business, Mr. Duvall? A. I am a traveling representative of this Company.

Q. What is the name of the Company? A. The Western Telephone Construction Company.

Q. Its quarters are located where? A. 250 South Clinton street, Chicago.

Q. Where we are now taking this testimony? A. Yes, sir.

Q. What have been your duties as an employee of the Western Telephone Construction Company during the past five years? A. I have been associated with them and also
1087 employed by them, part of the time as foreman and superintendent and traveling expert, and now as travelling representative.

Q. What is the business of the Western Telephone Construction Company? A. Manufacturing and selling telephone apparatus.

Q. What, if any, part does it take in the construction of telephone plants? A. None whatever.

Q. As representative of the Western Telephone Construction Company, have you had anything to do with the construction and equipment and maintenance of the telephone plant at Richmond, Va? A. Yes, sir.

Mr. WORTHINGTON: Counsel for the defendant object to all testimony by this witness tending to show the rates for telephone service in any other city than Washington upon the ground that the question involved in this case is what is the

cost to render such service in Washington, and that to go into testimony as to what is a proper charge in other cities involves an inquiry as to the differing conditions in those cities, and renders the inquiry an interminable one.

By Mr. BIRNEY:

Q. State what your connection with that plant was, when you went there, and when your connection with it ceased. A. It must have been in the fall of 1895 when I went there. I am not positive, but I think that is about the time.

1088 Q. You remained how long? A. I remained some three years.

Q. What were you doing there? A. I was employed first as an expert by the Western Telephone Construction Company to assist the Richmond Telephone Company in constructing a telephone plant in the city of Richmond, Va. Later I was employed by the Richmond Telephone Company as superintendent of construction and after the exchange had been completed to a thousand subscribers, I was employed as superintendent of maintenance, combined with that of superintendent of construction.

Q. When did your connection with the Richmond Company cease, Mr. Duvall? A. It ceased the 1st of April, 1898.

Q. Are you then familiar with the plant of the Richmond Telephone Company? A. Yes, sir.

Q. What is the character of that plant? A. The Company was formed for the purpose of giving the citizens of Richmond telephone service upon the expiring franchise of the Southern Bell Telephone Company, at reduced rates. The rates were specified by the city council.

Q. That hardly answers my question. What is the character of its construction? A. It is fair. The pole lines, the outside construction, are fair.

Q. Is it overhead or underground? A. Overhead en-

1089 tirely.

Q. What size poles were used? A. Quite a number of sixtys.

Q. What do you mean by sixtys? A. Sixty feet, ranging from seven to ten inches at the top and fourteen to sixteen inches at the bottom. It was necessary in several cases to go over the present construction of the Southern Bell Telephone Company. In one or two cases 75-foot poles averaging about the same size at the top were used.

Q. And the others generally used were— A. The balance were fifty feet, forty feet and a few twenty-five, used in the suburbs.

Q. How many telephones had that company in use at the

time you left its employment in April last? A. Between 1,400 and 1,500.

Q. What kinds of instruments were used? A. You mean the kind of apparatus, you do not mean the make?

Q. The kind of apparatus, and the make. A. Instruments manufactured by the Western Telephone Construction Company of Chicago.

Q. What kind of service is given the subscribers; metallic or grounded? A. Metallic.

Q. Is it all metallic circuit service? A. Yes; it was called for by the city council. Do you want me to specify the kind of switchboard?

Q. Yes; you may now specify the switchboard. A.
1090 The switchboard was the Keelyn Multiple Plug Board. The telephones were known as the Western Giant.

Q. What is the capacity of the switchboard? A. 1,500.

Q. Is that its ultimate capacity or was that the number actually used upon it? A. No; that was the capacity of the board; it was designed for that.

Q. Where was it manufactured? Here in Chicago? A. Yes, sir.

Q. And where was it wired? A. Partly here and partly in Richmond.

Q. When did the subscription list reach 1,000 subscribers? I think you said that your service was changed from one office to another at the time it reached one thousand. A. The subscription list was made up some time before the plant was installed. They had obtained a thousand subscribers, which was called for by the city council, a year prior to the installing of the plant.

Q. When did the service reach 1,000? A. Six months after the commencement of the plant. That was the capacity of the Southern Bell at that time.

Q. What rates were charged in Richmond prior to the establishment of this plant? A. $90, $60 and an additional charge for out of town connections.

Q. When you say $90, what do you mean? A. $90 a year.

Q. For what? A. For one instrument.

1091 Q. Business or residence? A. Business rates.

Q. And $60 for residences? A. $60 for residences. They had no regular charge. It was based on the distance from the exchange. They stated that it was impossible to operate an exchange under $6 a month per instrument.

Q. What rates have been charged by the independent company to subscribers in Richmond? A. $36 metallic line to business houses, and $24 metallic line to residences.

Q. What rates are now charged by the competing Bell Com-

pany? A. Their advertised rate is $30 and $20. I have known of cases where contracts were made on $9 a year for residences.

Q. Did you have opportunity to determine the relative quality of the service given by these two companies? A. Yes, sir.

Q. State what in your judgment it was.

Mr. WORTHINGTON: I object because the witness is not shown to have been competent to testify as an expert on that question and because it is not a question for expert testimony. The facts should appear, so the Court can judge.

A. In my capacity of superintendent of maintenance, I received all reports of what is known as trouble, and I had in my employ several men who had been with the Bell Telephone Company. Our average was never as high of trouble reports, as the Bell, by fifty per cent. This is one point in favor
1092 of good service.

Mr. WORTHINGTON: I object to that answer and move to strike it out on the additional ground that it is evidently made up from hearsay evidence, and is not the witness's personal knowledge, and also because the reports themselves would be the best evidence. I object also because the comparative merits or demerits of the two telephone companies in Richmond is not material upon the question as to the cost of operating the telephone exchange in Washington.

By Mr. BIRNEY:

Q. While you were there, did you have occasion to use the Bell instruments and lines? A. Repeatedly.

Q. Did you also use the instruments of the independent company? A. Repeatedly.

Q. Please state what difference, if any, you found in the service in that way? A. Our lines—shall I say our lines?

Q. You had better distinguish it the other way. A. The Richmond Telephone Company's lines were perfectly clear from what is termed induction, while those of the Bell Telephone Company invariably were full of induction, such as the noise from alternators and electric motor street cars, which interfered very materially with carrying on conversation.

Q. Which do you say was the better service? A. The Richmond Telephone Company.

Q. Did you have occasion as superintendent of construction and maintenance to determine the cost of maintaining
1093 that Richmond Telephone plant per annum? A. Only approximately.

Q. State how you made your estimate or calculations and what results you reached.

Mr. WORTHINGTON: I object to it because the data from which it is made does not appear and is not called for, in addition to the other objections as to going into expenses and receipts in Richmond to find out what they should be in Washington.

A. From my own knowledge of the amount of supplies purchased upon my orders for maintenance.

Q. Were the workmen under you? A. Yes, sir; I had entire charge of all work.

Q. What about the pay rolls for that branch of the work. A. The pay rolls were not under my charge except as to turning in the time.

Q. With that knowledge, what did you determine was the cost of maintenance as distinguished from the operating and other expenses of the company of each telephone per annum? A. $1 per year.

Q. Did you ever make an estimate of the entire cost, including the other expenses of the company, or were you in a position to know of the other expenses? A. The other expenses consisted of the officials' salaries. I only know that from hearsay.

Q. That is, the amount of the officials' salaries you mean? A. Yes.

1094 Q. Were you able to determine and did you determine at any time whether the receipts were in excess of the expenditures or not of the Richmond Telephone Company? A. Yes; they were.

Q. Can you state how much in any year? A. No, sir.

Q. Was there a deficiency in any year while you were with that Company, or receipts for expenses? A. No; there was no deficiency from expenses.

Q. Are you familiar with the independent company's plant at Petersburg, Va.? A. Yes, sir.

Q. How large a plant is that, Mr. Duvall? A. It is now between 500 and 600 subscribers, to the best of my knowledge.

Q. How did you become familiar with that? A. I was employed to install the new equipment of switchboard apparatus, and in general expert work on outside construction.

Q. What is the ultimate capacity of the switchboard there? A. 600.

Q. How long has that company been in operation? A. It was in operation some year or so prior to the Richmond Telephone Company.

Q. Somewhere about five years? A. Yes; somewhere about that. You see, I do not know the exact date. I would not commit myself to the time.

Q. What are the rates charged in Petersburg?

1095 Mr. WORTHINGTON: We make the same objection here.

A. $18 and $24; $18 for residences and $24 for business houses.

Q. Have you installed for the Western Telephone Construction Company any other plant than that at Richmond? A. Quite a number. I am unable to say exactly how many.

Q. Where? A. I am unable to say exactly where they are.

Q. Give some of them. A. My installing consisted of new apparatus—not always a complete installing. There might have been somebody else at a prior time connected with these places. At Bloomington, Ill. It is hard for me to remember all the places, because it has been a period of some time. I have lately been identified with installing apparatus at Indian Head, on the Potomac River below Washington, and some few instruments in the Treasury in Washington. There are so many little towns in Indiana that I don't remember the names.

Q. You have done this same work in many towns in Indiana? A. Yes, and throughout the southern portion of the country.

Cross-examination.

By Mr. WORTHINGTON:

Q. Did you for the company with which you are connected have anything to do with installing the telephone exchange in the Interior Department in Washington City? A. The company did and I had; yes.

Q. When was that? A. It must have been in 1894—the latter part of 1894 or the first part of 1895.

1096 Q. Is that the same kind of a plant which you installed in the Treasury Department and at Indian Head? A. Yes.

Q. These were all three done for the Government of the United States? A. Yes. They were general lines; yes, sir.

Q. Was it the same general system that you installed at Richmond and Bloomington and these other small towns you have referred to? A. The same general apparatus; yes, sir. The system in the Interior Department differs from the others only in that it is an interior system and the other systems are what you would call commercial systems.

Q. The operation is the same? A. The same; yes, sir. We use the same switchboards.

Q. What is your age, Mr. Duvall? A. Twenty-seven.

Q. Do you know whether the Richmond Telephone Company has kept a regular set of books showing what its receipts and expenses were? A. Yes, sir.

Q. It did? A. Yes, sir; to the best of my knowledge.

Q. Have you any reason to suppose that those books are not still in existence? A. No.

Q. Do you know of any reason why its financial operations and the result thereof should be shown by your testi-
1097 mony here in Chicago instead of by the evidence of the books themselves? A. I don't think I testified to that.

Q. Have you not testified that *their receipts* every month exceeded their expenditures? A. Yes, sir.

Q. If that is so, these books will show what the difference was? A. Not necessarily; no sir.

Q. Why? A. Do you want to know why I think so? Is that it?

Q. Yes. A. I know the character of all the men and the amount of money that they represent, and I have been informed by the gentleman that invested most of the capital that he refused to furnish any money to carry on construction after a thousand telephones had been connected up. I have been informed by the president of the company, who had no financial backing or money of his own, that the company would have to carry on its extension of additional lines out of the monthly receipts; and I know also that the contractor before mentioned received at certain intervals such payments as were due him for the money advanced for construction.

Q. Do you think those facts would not appear from the books of the company? Will not those books show what part, if any, of the earnings were devoted to new construction? A. These books were kept by the president, and I do not believe that they would show it.

1098 Q. What is the name of the president who keeps the books? A. You must understand that I do not say he is the bookkeeper.

Q. You say he kept the books. Explain what you mean. A. I mean that he is responsible for entries in the books such as you speak of.

Q. Have you any reason to suppose he has falsified the books or suppressed the facts? A. None whatever.

Q. What is his name? A. John C. Robertson.

Q. What do you mean by saying, then, that the books of the company would not show the facts as to its financial transactions, what its receipts are, the sources from which they come, and how the money was spent? A. I think there is an arrangement between the contractor and the company that covers all that, outside of the books.

Q. Have you given us all the sources of information you have as to what those books will show? A. Yes, sir.

Q. Do you know what was the method of making entries in those books when material was furnished, to be used as main-

tenance? A. The only method was that in which I obtained my orders that I know of.

1099 Q. Did you make any entries in the books or have any made? A. No, sir; except my own books.

Q. Do you know whether or not in the regular books of the company there were proper entries as to all the money spent from time to time for maintenance? A. No, sir.

Q. Have you any reason to suppose that the books would not show those expenses? A. No, sir.

Q. Have you any reason to suppose the books would not show the receipts and distinguish between rentals and money received from other sources? A. No, sir.

Q. Why do you say you think the books of the company will not show the results of its financial transactions? A. I didn't probably understand your question. Will you put that question again?

(The last question was repeated by the stenographer.)

A. What I meant to say was that the books would not show the profit. That is what I meant to say.

Q. Do you mean because the profit was largely or wholly expended in new construction? A. That is what I mean.

Q. Would not the books show that? A. I don't know.

Q. Did you ever see the books of the company? A. Yes; I have seen them.

Q. Did you ever see the contents of them and know
1100 how they were kept? A. No, sir.

Q. That was no part of your business? A. No.

Q. Do you know of any reason why the affairs of the Petersburgh Company, of which you have spoken, should not correctly appear from its books? A. No, sir.

Q. Do you know of any reason why if the Petersburg Company can do business successfully at $24 per annum for business and $18 for residences, why the Richmond Company should be entitled to receive $36 for business and $24 for residences? A. None whatever; but that was specified by the city council in the grant.

Q. Is there any difference, according to your experience, between what are remunerative rates in a small town and in a large city? A. None; in the operating expenses.

Q. I did not confine my question to any particular kind of business, but to the whole. A. In those two individual cities, if you are putting it that way, I do not.

Q. I am not speaking of any two individual cities. I am asking you whether your information has been sufficient to enable you to tell us whether or not rates which are remunerative in a small city of 200 subscribers would necessarily be remunerative in a city of several thousand subscribers? A. I
1101 don't see any reason.

Q. Then if business can be done in Petersburg at a profit at $24 for business and $18 for residences, in your judgment it could be done at Detroit, for example, at about the same rates? A. I don't know the conditions in Detroit, but on the same basis, yes.

Q. You do not know of any difference between a small town and a large city which would make any difference in that regard? A. No; I mean with the same kind of exchange, you know.

Q. What kind of switchboard was installed by the Richmond Company, with which you were connected? A. The Keelyn multiple plug board.

Q. Did you participate in the construction of that board? A. Yes, sir.

Q. Then please describe its construction and operation. A. The board consists of a frame of 1,500 capacity, a board from 32 to 33 feet long and 7 or 8 feet high, with a suitable table provided in front for the placing of the necessary circuit changers and switching devices, to be handled by the operator. Above this is located a panel at each operator's seat which contains spring jacks and an enunciator drop.

Q. Please describe the operation of that board when
1102 one subscriber calls and wants the operator to put him in connection with another. A. Upon a call arriving at the office upon the switchboard, what is known as a plug is inserted in the spring jack, which is connected with the said call or enunciator drop. The operator's circuit changer is then put in motion, enabling her to ascertain what the party desires. Upon receiving the number, provided it is in her section, she takes up the other end of the cord and plug that she has already inserted and places it in the spring jack of the number called. Then by moving her circuit changer to the proper position she sends an electrical impulse out on this line, which calls or causes the ringer of the subscriber to vibrate and play upon two gongs. The connection is then complete.

Q. You have not told us what she does if it happens that the subscriber who is wanted is not upon her section. A. If the subscriber called for is beyond her reach, or, in other words, her section, she then trunks the number with the letter of her section to the section desired, and upon receiving the signal that connection is made, she moves her circuit changer to the proper ringing position, which acts in the same manner as before mentioned.

Q. How many subscribers' lines does one operator on that Richmond switchboard have within her reach? A. 300.

Q. Then if there are 1,500 subscribers she, as to four-fifths of them, has to communicate through a second operator?
1103 A. Yes; that is not exactly right.

Q. If it is not exactly right, please correct is so as to make it exactly right. A. The proper term of the other operator would be an auxiliary operator, as she performs the same functions to the operator first mentioned.

Q. Are the switchboards which you have installed or added to in the Treasury Department, Interior Department, at Indian Head, at Bloomington and the other small towns to which you have referred the same in their general operation and construction as the one you have just described? A. Yes, except that this is a multiple board and the others are not.

Q. Will you please describe what is the difference between that Richmond switchboard and the others, so that that becomes what you call a multiple board and the others are not multiple boards? A. The other boards are of smaller capacity, and all of the operators can connect direct without any switching device, to any number desired or called for.

Q. Do you mean that there are not more than 300 subscribers in any one of those exchanges? A. No; I do not mean that exactly, because you can reach on some styles of our boards over 300.

Q. What is the maximum number that one operator can reach with your style of board? A. That is a matter of opinion.

1104 Q. What is the greatest number reached by any switchboard at present in operation in any place? A. 320.

Q. Where is that? A. That is in Petersburgh.

Q. How long has that switchboard been in operation there? A. In Petersburgh?

Q. Yes. A. The present switchboard was installed about the same time the Richmond board was installed.

Q. You have said that the lines of the Richmond Telephone Company are all metallic circuit. Will you please state just what you mean by that, Mr. Duvall? A. Every circuit that they have or every subscriber that they have at both terminals of his telephone is connected to a metallic connection, and not connected in any manner with the earth for the purpose of using it as a wire.

Q. Does each subscriber have his own return wire, or do they in all or in some instances use a common return wire? A. The original thousand have no common return wire. There are, however,—or there were; I do not know that there are now—some eighty odd telephones on what is termed by some a common return wire.

Q. How about the additional telephone wires over the one thousand? A. They are metallic.

1105 Does each one of the new subscribers have his own return wire? A. Yes; at the time I was there.

Q. I wish you would tell us what kind of wire was used in those circuits, the material, the size, the weight and the make. A. The wires of the majority of the subscribers consisted of a twisted pair copper wire, No. 20, which was contained in aerial cables, lead covered, varying from 25 to 100-pair. These wires led to what is known as a cable box or junction pole. From there they were led to the nearest point of a subscriber's station by what is known as galvanized iron wire, No. 14. I believe the majority of this wire was furnished by John Roebling & Son, and Washburn & Mohn. It is a common telephone wire.

Q. You finished describing the wire, did you? A. Yes; I could not give you the weight.

Q. The number would show that? A. Yes; if a subscriber is half a mile from the exchange, his wire would weigh so much. The weight of that cable, 25-pair, runs about a pound and a half to the foot.

Q. Do you know when you left there about how many miles of copper wire they had in use and how many miles of galvanized iron wire, connecting with their subscribers? A. That would be hard to tell. I can give you an approximate estimate of it. I believe they had 14,000 feet of cable.

Q. And how many feet or miles of galvanized iron wire? A. I should imagine about 800.

1106 Q. 800 feet of 800 miles? A. 800 miles. There is a lot of miscellaneous wire that you cannot keep any track of.

Q. For what purpose was that miscellaneous wire used? A. There is what we call the inside wiring of a building, the wires that come inside from the outside connection, the heavier wire, and then the wire on returns, what is called the jumper; and then also a wire that connects from the cable heads to the switchboards. That all amounts up to something.

Q. What kind of wire was used in the inside equipment of the subscribers' telephones inside of their places of business or their residences? A. That is what is called No. 16 enunciator wire.

Q. Iron, steel or copper? A. Copper.

Q. Please describe the telephone instruments which that company placed at its subscribers' stations. A. It consisted of a walnut backboard and a battery box; a walnut box containing a magneto generator, a crank for operating the same, a ringer, gongs for the same, an automatic hook, the necessary contact springs and wires, mounted on the backboard below the generator box, a walnut box, which contained what is known as the Western giant transmitter of the granular carbon type, and the necessary induction coil and agitator for the

transmitter; a double pole hard rubber hand telephone provided for a receiver, with the necessary tinsel cord con-
1107 necting the same with the generator box.

Q. You described the transmitter as a granular carbon instrument. There are a great many telephone transmitters which come within that description, are there not? A. Yes.

Q. Please describe this particular one, so that it may be distinguished from other granular carbon transmitters. A. The best description of it is in its name. How they differ from other transmitters would have to have some comparison.

Q. Can you describe that instrument? Do you know how it is made and how it operates? A. Yes.

Q. Please do so. A. The transmitter consists in a metal cup with a carbon diaphragm upon which rests a hollow rubber back. Contained in this rubber back is a disc of specially prepared carbon. Between the carbon diaphragm and the said disc are contained the granules or powdered carbon. The brass cup is provided with a thread to which is screwed a rubber mouth-piece. The same is mounted upon the lid of the walnut box and is held in place by a heavy spring and a contact spring, which allows the transmitter to be revolved in either direction.

Q. You have given us the height of the poles which the Richmond Company used. Of what material were they? A. They were not all of the same kind. I think they were cypress.

1108 Q. Are you sure? A. You know there is a whole lot of poles down there. There may be cypress poles and there may be cedar.

Q. Do you know what they are? A. I know some of them were cypress.

Q. Did you not superintend the setting of the poles? A. Yes.

Q. Can you not tell us in the main of what kind of wood they were composed? A. I should say they were cypress, but you might find there are some cedar poles.

Q. Do you mean to say that you know they were all either cypress or cedar? A. No; I do not mean to say that.

Q. Do you mean to say that one-half of them were either cypress or cedar? A. Yes.

Q. Three-fourths of them? A. Somewhere along there.

Q. I think you have already said that the entire system is an overhead one? A. Yes.

Q. Can you tell us at the time you left there what was the average distance from the exchange of the subscriber's stations? A. No.

Q. Do you know whether or not the company owned the building in which its central office was situated? A. It
1109 did not.

Q. Do you know of your own knowledge what kind of a plant the Petersburgh Company, to which you have referred, had, aside from the switchboard as to which you have already testified? A. No.

Q. Was it overhead or underground? A. Overhead.

Q. Copper wire or iron wire? A. There was some copper and some iron.

Q. What proportion of copper wire and what proportion of iron wire? A. I could not say that.

Q. Do you know anything about the kind of wood they used in their poles or the height of the poles? A. No.

Q. Were you ever down there to inspect that plant? A. Yes.

Q. You cannot tell what kind of poles they had? A. Yes; if that had been my special visit there for poles, I should have counted them. I was not there on that line. Switchboard work was what I was there about.

Q. Do you know the height of their poles? A. No; they struck me as being about the same height as the Bell poles there. There is nothing very high, though. It is a small place.

Q. If they struck you as being about as high as the Bell poles, you ought to be able to tell us how high they were. A.
1110 I can say about, yes.

Q. About how high were they? A. About forties.

Q. When you speak about a pole being 40, 50 or 60 feet, do you mean that is the length of the pole before it is set up, or that is the height above the ground after it is planted? A. What I mean is that is the length of the pole. If they stick it in the ground eight feet, they take off eight feet of the pole.

Q. Was that the case with the Richmond poles when you have been giving us their heights? A. Yes.

Q. In Richmond was there any general rule as to the number of cross-arms on the telephone poles of the Richmond Telephone Company? A. No; if a pole is overburdened, the city engineer would tell us to take that pole up and put another one in. It is a matter of judgment.

Q. How high on the average, or how far was it, from the ground to the lower cross-arm? A. Most of our wires, outside of one lead, were cables. Of course there were very few cross-arms. It would take about three or four feet off the height of the pole.

Q. Do you know what the Richmond Telephone Company paid as daily wages to laborers while it was constructing
1111 the plant? A. Yes.

Q. What? A. We paid at one time $1.75 a day to what are known as linemen. We paid at that time $1 a day to

what are known as ground men. Later on we reduced the linemen to $1.50 and the ground men to 90 cents.

Q. What was the proportion between the number of linemen you had and the number of ground men? A. That is a matter of choice with the foreman.

Q. How did it average? A. About one to three.

Q. About one line man to three groundmen? A. Yes; about that. But the situation is never the same. The groundmen are picked up and taken off and picked up again. You can't tell.

Q. Were the laborers generally white or colored? A. We had one gang of colored laborers while we were constructing.

Q. I believe you have told us you do not know what salaries the Richmond Company paid to its officers or whether it paid any? A. I know it paid salaries, but I do not know what they were.

Q. Do you know what it paid its operators? A. Yes; I had direct charge of that.

Q. Then you can tell us all about it. A. We paid our day operators $20 a month. We paid the relief operators
1112 from $12 to $15. We paid our chief operator $35. Those figures may be changed by this time.

Q. Were the plants which you constructed in Bloomington and other small towns or concerning which you have testified all overhead plants? A. Yes.

Q. How many telephones in the plant which you installed in the Interior Department in Washington? A. I didn't install that. I said I was connected with it.

Q. What did you have to do with it? A. I went there this summer.

Q. This past summer? A. Yes, sir; to take the matter up with the department with regard to the exchange. I was connected with the manufacturing of the instruments, but I had nothing to do with putting the plant in.

Q. I think you have said that plant is similar to the other plants, like the Richmond Telephone Company's plant? A. Yes.

Q. Except that it is not a multiple switchboard? A. It is not a multiple switchboard, and it is a ring call and a push button call. That is the difference.

Q. Do you know what company constructed that plant in the Interior Department? A. It was pretty badly split up, I believe. One firm did the wiring, I believe, in Washington. We had an expert there, who was there to see that it was properly installed.

1113 Q. When you say "we," what company do you mean? A. This company.

Q. This company installed the plant? A. I am not sure about that.

Q. Why did you go down there last summer to see about it? A. They sent me down there as the representative of the company, to see just what the trouble was. There was a good deal of correspondence on the subject. They did not seem to be able to arrive at any definite conclusion as to what was the trouble; so I went down there in the capacity of a representative of the company and an expert on telephone matters.

Q. Have you adjusted the troubles? A. As far as I am concerned, I have adjusted them.

Q. Do you know whether or not that plant is still in use in the Interior Department? A. It is still in operation.

Q. Do you know whether or not it has been decided to remove it and put in its place another system? A. No, sir.

Q. Was this interior department system, concerning which you are testifying, wholly within the Interior Department Building, or did it extend outside? A. It extended outside in what was known as a trunk line.

Q. Where did the trunk line go? A. The trunk line ran from the Patent Office to the Pension Building, and
1114 then another trunk line went up on F street to another commission up there, I don't remember the name of it.

Q. Any other place? A. There were three distinct switchboards, as I remember it, and they were located in different Departments. I can safely say there were not over six trunk lines in all combined; but as I was a stranger when I went to Washington, I didn't know the different places.

Q. You did not help to install that plant, then? A. No.

Q. But went there afterwards for this company? A. I helped make the apparatus, most of it.

Q. As to the plant which you have spoken of in the Treasury Department; do you know whether it is still in operation? A. I did not term that a plant. I said I installed some apparatus there. It is not any plant. There are only three or four instruments in there. They run from the stationery department down to its different departments and then there are two or three scattered through the building in different departments.

Q. Do you know whether they have proved satisfactory and are still in use? A. Yes; the last I heard of them, they were satisfactory.

Q. When was that? A. That was only a few weeks ago.

Q. As to the plant at Indian Head. I believe you did
1115 install a plant there? A. I did not install it. I designed the plant.

Q. And your company did not install it? A. No; our company did not. There are local men down there installing it.

Q. Local men connected with this company? A. No, connected with the Government.

Q. Your company furnished the plant to the Government and the Government itself installed it? A. Yes.

Q. How many telephones were there in that plant? A. There were twenty telephones and a forty capacity switchboard.

Q. Do you know what has become of that plant? A. No.

Q. Do you know whether it is in use now? A. I don't even know that, of my own knowledge.

At this point a recess was taken until 2 o'clock, at the same place.

After Recess.

Cross-examination of Stanley A. Duvall resumed.

By Mr. WORTHINGTON:

Q. Mr. Duvall, you have said, as I understand, that the cost of maintenance of the Richmond Telephone Company was not more than $1 a year per telephone? A. Yes.

1116 Q. What do you include in that expense? The renewals of parts of telephone instruments.

Q. Nothing else? A. And what we call a general inspection, which occurs three times a year.

Q. Was that general inspection made only three times a year by the Richmond Company? A. Yes.

Q. How many inspectors did they have? A. We generally employ two to make that general inspection.

Q. What were they paid? A. I don't remember. I think it varied with the men. Sometimes they paid $1.50, and sometimes they paid $2.00 a day.

Q. He was employed annually, I believe? A. No.

Q. He was just employed and paid while he was making inspection? A. Yes; we put on what we called an extra man. Then if there was other work, that man that we had on general inspection would work most of the year; but he was not on regularly.

Q. Did the company employ an electrician at the central office in keeping the switchboard and appurtenances in good order? A. Yes.

Q. What did they pay him? A. He had other duties outside of that, though. I don't remember, but I don't think it

1117 was over $2 a day. I know it wasn't over $2.

Q. Did that company find it necessary to do anything to keep its lines in repair—poles, appurtenances and wires? A. Yes.

Q. Who attended to that? A. That was done by the construction gang.

Q. How many were there in that gang? A. It varied. The

way we did it was this: We took the construction gang whenever we had any repairs to make, and put them on the repairs; and we kept the time on that particular work until they went back on construction, and it would be charged against it.

Q. The cost of replacing parts of telephones, the cost of inspection and the cost of an electrician, repairs to the central office and the proportionate cost of the construction gang while they were at work on repairs of the lines, amounted in all to not more than $1,000 while they had a thousand telephones—$1,000 per annum? A. Yes, but you are including in there more than I included when I made the statement.

Q. I wish to find out just what you did include in your statement. A. I included the man at the board in the operating expenses. He went in the pay-roll of the operating expenses. That is all outside of that.

Q. How much of the pay of the construction gang was charged to maintenance during the last year you were in
1118 Richmond? A. I couldn't tell that.

Q. Do you know whether that amoounted to as much as $1 per telephone? A. Oh, no.

Q. Less? A. I don't know; I couldn't tell.

Q. Was that included then in your estimate of $1 a year per telephone? A. Yes; that was included; I can approximate it. I don't know it exactly.

Q. Approximately; what was the expense of the construction gang that was charged to maintenance during the last year you were with the Richmond Company? A. We didn't do over $10 worth of work of repairs a month.

Q. That does not answer my question. A. Combined with the other—that is what I meant

Q. The work of keeping in repair the entire outside plant did not exceed $10 a month? A. No.

Q. Is that what you wish to say? A. That is what I wish to say—outside of accidents. I don't include accidents in that.

Q. What do you mean by accidents? A. I mean this: Suppose that a pole of the Electric Light Company should fall down on our wires, and things of that kind. We fortunately did not have any of those.
1119 Q. You say you did not have anything of that kind? A. No.

By Mr. BIRNEY:

Q. Did you never have anything of that kind. A. We didn't have any poles fall down on our lines. We had one or two accidents, but they were of such a small character that they amounted to very little. There is alwaays that danger in a telephone company.

By Mr. WORTHINGTON:

Q. I wish you would now state in detail exactly what work is included in that which you say did not cost more than $1 per annum. A. The repairs to our telephones, general inspection—of course we could not make any repairs to a telephone without a general inspection—and the repairs to our lines.

Q. Did it happen to that company that sometimes it would lose a subscriber? A. Of course we lost a few. The number would not go over twenty-five all the time I was there, that actually ordered out the telephones. We removed a good many of our telephones because people took advantage of the rate war. They would take ours for six months and then take the other for six months. We weeded out that kind of subscribers.

Q. Do you include in your extimate of $1 per telephone the expense and loss to which the company was put by having to take down apparatus of a subscriber who left the exchange? A. That was very little.

1120 Q. Did you include that? A. Yes; I included that. Of course, you see, when they took down the apparatus of one man, we would get half of that sum and then get half to put it up. We had boys putting them up. That would come in under construction.

Q. Did you put up in a new subscriber's station the wire or part of it that you took down from one when you would lose a subscriber? A. No; we would leave that wire there.

Q. It was then a complete loss to the company? A. Not at all.

Q. Why? A. Because any wire that is out can be converted almost any time during the year, for use. We never had a dead wire all the time I was there—over three months.

Q. How about the inside wire? A. The inside wire would cost not over 25 cents. We could afford to leave it stay there.

Q. The kind of wire that you used then would not average over 25 cents per subscriber for inside wire? A. Not the actual wire; no.

Q. I mean the cost of putting it up, too? A. Of course that is different. The wire generally retails at from 21 to 24 cents a pound, and runs 125 feet to the pound. That would give a pretty good lead into an office, you know.

Q. What were the gross receipts from rentals of the Richmond Telephone Company during the last year you were with it? A. I couldn't give that.

1121 Q. What were its gross expenses of operating and maintenance? A. Just about what I stated there. I haven't any figures on the subject. There was $500 a month pay-roll.

Q. And $1 per year per telephone added? A. Yes.

Redirect examination.

By Mr. BIRNEY:

Q. Mr. Duvall, you have been asked about the plant in the Interior Department, and you state that you went there to see what the trouble was last summer. What did you find to be the trouble and difficulty with that plant? A. I found the system in very bad shape. There was a very incompetent man in charge of the same, and an unwillingness on the part of the chief clerk to pay a sufficient amount of money for a man to have any technical ability. Where two cells should be used on the microphone of the telephone, there would be one cell, and instead of repairing a telephone before it got completely out of order, it was allowed to get entirely out of order before the assistant was notified.

Q. You mean before the user was notified? A. Yes. I was there some two weeks going over the ground for them, for the benefit of the company, and trying to make some arrangement to get the exchange on a better basis to give better
1122 service.

Q. Did you make a careful examination of the system? A. Yes, sir.

Q. And you found it to be in bad order, as you have stated? A. Yes.

Q. To what did you attribute that bad order? A. To neglect.

Q. What kind of man did you find in charge of it? A. I found a young man who was, to the best of my opinion, simply an ordinary bell-hanger. He had never had any experience before in regard to telephones, and he was out on his wheel a majority of the time I was there.

Q. Did you examine the wires to see how they had been laid? A. Yes.

Q. What did you find as to that? A. I found in some cases, quite a few, where two wires had been placed under one staple.

Q. How did that affect the wires? A. Where the staple had been driven up hard against the wires, it caused a leak into the wall, and sometimes a break in the circuit.

Q. Why would that cause a leak? Just explain that. A. It would bruise the covering of the wire and cut down the capacity of the insulating material that the wire was made of.

Q. What did you find had been done by the Interior
1123 Department or by the Government to remedy these defects, if anything? A. Nothing whatever. I found a few parts had been purchased by the custodian, but there had never been any systematic effort made to keep up the system.

Q. Has this company at any time supplied these parts for the system—springs or the like? A. Yes; there was one time a shipment of springs sent on there that were supposed to have been put on the telephones, which would greatly improve their working; but it had been neglected to place them there.

Q. Had they been put on? A. No, sir.

Q. How long ago was that shipment made? A. I don't know about that.

Q. Did the Western Construction Company have anybody in charge of that system since it was put up? A. No, sir.

Q. Does the Western Construction Company have a man, an agent, upon the ground or in the city of Washington permanently? A. Yes.

Q. What business is he in? How does he represent the company? A. I was there myself for the past six months.

Q. You mean during all the six months? A. Yes; not all the time, you know. I was located there. That was my mailing point, where I obtained my mail.

1124 Q. Was there anyone else there before that time? A. I am not sure. I know that at one time a gentleman in the Patent Office had charge of this system. It was under his personal direction. Whether he was representing the company or not, I don't know. I know we have had our traveling expert there to look at it. He was there while I was in Washington.

Q. He came there occasionally, I suppose, in the course of his travels? A. Yes. We sent men there repeatedly; not exactly at their request, but whenever they complained.

Recross-examination.

By Mr. WORTHINGTON:

Q. Who was the young man who was in charge of that Interior Department plant? A. A young man there by the name of Marcan.

Q. What compensation did he receive? A. The chief clerk informed me that he received $40 a month.

Q. You say the chief clerk was unwilling to pay sufficient for a man technically competent for such work. What, in your opinion, would be the proper compensation for such a man with sufficient technical ability to keep that plant in order and know what was the matter with it? A. Between $75 a month and $1,000 a year.

Q. How much did the Richmond Company pay its expert who regulated matters in its exchange? A. They paid about $1,200.

1125 Q. About $1,200? A. Yes.

Q. Do you know exactly? A. Yes; I might make a mistake. I don't want to make any statement unless I am positive about it. It was no less than $1,200.

Q. What were you doing in Washington for six months? What was your business there? A. I was representing the Western Telephone Construction Company.

Q. Representing it in what, Mr. Duvall? A. In almost any department that they wished to put me in. I was selling goods most of the time.

Q. Selling goods where? To the Government? A. To the Government, and attending to our eastern trade. If there was anything wrong with any of our apparatus, of course I made an effort to repair it.

Q. What apparatus did your company have in Washington during those six months, aside from the three plants you have already described, in the Interior Department, the Treasury Department, and at Indian Head? A. I don't know. I sold a lot of miscellaneous telephone apparatus out there. Yes; there is another plant there. It is the same thing almost as the Department of the Interior. It is at the Insane Asylum.

Q. Did your company have a plant there—a system of telephones? A. Yes.

1126 Q. How many? A. I was up there and went over with the doctor. It was not over 20 or 30.

Q. You said something about also attending to the eastern trade of your company there? A. Yes.

Q. At what points did you attend to the Eastern trade of the company while you were located in Washington? A. In Baltimore and the western part of Maryland. Of course that is not really east, but what I meant was east from here, and throughout Virginia.

Q. What compensation were you receiving from the Western Telephone Construction Company at that time? A. From this company?

Q. Yes. A. I was receiving a commission.

Q. How much did you earn in your dealings with the Government during those six months? A. What do you mean; how much commission did I make off the Government?

Q. Yes. A. I don't know.

Q. Who was the man at the Patent Office who had charge of this plant there and of whom you say you do not know whether he represented this company or not? A. He was employed by the Government. He could not very well represent this company. I have since thought of that. His name was Clements.

STANLEY A. DUVALL,
By the Examiner, by consent.

1127 Subscribed and sworn to before me, this —— day of ——, 1899. ——— ———,
Examiner in Chancery.

1128 Office of Western Telephone Construction Co.,

250-254 South Clinton Street, Chicago, Illinois,

January 16th, 1899, 10 o'clock a. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney.
Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.
Present, also, Mr. Charles Darwin Haskins.

Mr. BIRNEY: I will inquire of counsel for the defendant if it is intended to call Mr. Haskins as a witness in this cause. If so, I request that Mr. Haskins retire.
Mr. WORTHINGTON: To which counsel for defendant respond that they have no present intention of examining Mr. Haskins. At all events they request him to remain.

JAMES E. KEELYN, a witness of lawful age, called by and on behalf of the complainants, having been first duly sworn, is examined.

By Mr. BIRNEY:

Q. Please state your age, your place of residence and your occupation? A. Age, 41 years; residence, Evanston, Cooke County, Illinois; place of business, Chicago.

1129 Q. In what business are you engaged? A. I am president of the Western Telephone Construction Company, a corporation engaged in the manufacture, construction and sale of telephone exchanges and appliances.

Q. What appliances are manufactured by the Western Telephone Construction Company? A. Telephone exchange switchboards, telephones, lightning arresters, cross-connecting and distributing boards, and the general paraphernalia complete called apparatus, used commonly in telephone exchanges.

Q. How long has this corporation been carrying on such business? A. Since March, 1893.

Q. Where are its offices and factories? A. At the place of taking this testimony, 250 South Clinton street, Chicago.

Q. What kind of telephones, and by that I mean complete instruments, are manufactured by the Western Telephone Construction Company? A. We make various kinds of telephones, particularly those which are used for public intercommunication in cities.

Q. Do you manufacture any long distance telephones? A. Yes, sir; that is our principal business, the manufacturing of long distance telephones and switching devices to interconnect them for communicating purposes.

Q. Under your system of business, when equipping telephone exchanges, do you sell your goods outright or do you
1130 retain rentals or royalties? A. We well outright, as a rule.

Q. Does that hold good with your switchboards, as well as the other apparatus? A. Yes, sir; that is true of our manufactured product generally.

Q. At what price do you sell the telephone of the long distance type called the wall cabinet equipment? A. We make several types of telephones which might be called long distance telephones. In about 100 different cities operating public exchanges at present, there is a demand for, and we are furnishing to them, what is considered a modern type of first-class long distance telephones instrument, complete, for a subscriber's station outfit, consisting of a magneto-generator, a call bell, lightning arrester, back board and battery box, two cells of batteries, first-class bi-polar telephone receiver, connecting cords, induction coil, rocker arm, transmitter, mouth piece and necessary strings, binding posts, &c., to constitute a complete operative instrument, capable of being paralleled with a thoroughly first-class modern telephone for long distance and local telephone exchange purposes, which we sell nominally at a price of about $11 for each station outfit, practically mounted, ready for use, other than the mounting of the batteries, which require the liquid filling objectionable for transportation purposes. This instrument by tests, experimentally and in
1131 practice, under like conditions of line work, has proved itself, in our examinations, equal for telephonic service in such a city as Washington, D. C., to the first-class long distance Bell telephone used for like purposes. I have gone into details on that more than necessary, perhaps; but I would say that we furnish a complete subscriber's telephone outfit for considerably less money, ten or twenty per cent less, and have some types of instruments for which we charge more than $11, the price stated, being special in type from that in ordinary use.

Q. At what price do you sell the best character of separate moving desk equipment? A. For $12.50 to $15, per complete station outfit.

Q. At what price do you sell the auxiliary desk attachment of the best character? A. An auxiliary desk telephone outfit, such as is used in offices on a desk, without the magneto bell, would sell at the price of from $8 to $10. It should be understood in my answers that the quantity purchased would have some influence upon the price. These prices as given are the ruling prices at which they are being sold in ordinary quantities.

Q. What is the character of the telephone switchboards built

by your company? A. We claim and believe that from a comprehensive point of view they are equal in service efficiency to any built. I mean by service efficiency that they will serve for interconnecting telephone lines in a telephone exchange as favorably as that of the best other type known; that from a point of construction they embody as high character of workmanship and material. The workmanship, material and
1132 design would give the results first mentioned of efficiency of service, with proper management to direct their operation. It may be said upon this that upon a recent examination of two well-known types, this type I mentioned that we are manufacturing, now in practical use in the city of Newark, N. J., and that of the Western Electric Express system or multiple switchboard system, such as the Bell Telephone Companies use in their larger exchanges, I found that the service was superior, as acknowledged by the subscribers themselves.

Mr. WORTHINGTON: I object to this as a statement of hearsay evidence from unknown people.

A. By a personal test of my own in calling up the two different exchanges and asking for connections for the particular purpose of determining for my own information whether the results were better in the one than in the other, I found, as indicated, a better degree of satisfaction, a better result of service in responding to calls, from the central office, and interconnecting the lines, than that obtained through the Western Electric switchboard.

Q. What do you style that type of board which you are manufacturing? A. We call it our multiple transfer system.

Q. How long have you been manufacturing that board? A. The principal parts of the switchboard are designed upon lines such as we have been making switchboards from for a
1133 year or two or more. In the Newark switchboard, particularly, we have some devices not in use in other boards, while we may have left out of that board some of the devices which we use in other boards. It is a rule in making switchboards for large exchanges to design them somewhat to suit that particular system, depending upon its location of central offices. If they are branch offices, or if it is all in one office, the designs and plans would be made out accordingly as we work up our apparatuses.

Q. Has the Western Telephone Construction Company constructed and established many telephone exchange plants? A. We have, directly or indirectly, either through the engineering or superintending, or in an advisory capacity, towards the engineering and superintending, and the manufacture of this apparatus and furnishing supplies, been connected with, I should say, several hundred public telephone exchange systems.

Q. Where are the most important of those exchanges? A. At Newark, N. J., so far as apparatus equipment is concerned; at Fort Wayne, Ind.; at Wilmington, Del.; at Norfolk, Va.; at La Crosse, Wis., at Richmond, Va.; at Johnstown, Pa.; at Chester, Pa.; at Newark, Ohio; at Chillicothe, Ohio; at Charlestown, S. C.; at Paterson, N. J.

Q. In what States are the smaller exchanges which you have not named and which have been equipped or partially equipped by your company? A. Do I understand you to mean what States we have entered?

1134 Q. Yes; what States, without naming the little towns? A. I believe there is one or more telephone systems using our apparatus in every State in the Union, and I think in every Territory. I believe there cannot be more than two or three States certainly where we have not established telephone systems which are using our apparatus. I believe we have about between five and six hundred telephone systems represented in our list of telephone exchanges, part or all of which equipment was furnished by us and known as western exchanges.

Q. In establishing those exchanges, what part have you taken in preparing estimates and calculations of the cost? A. We have made estimates upon nearly every part of the cost of a telephone exchange, as involved in modern practice. I mean by that, with reference to underground work, we have prepared estimates and data as to what it would cost to take up and lay down pavements, as is usual, to dig trenches for conduits, and refill them after the conduits have been placed in them; the cost of conduits and laying of conduits; the prices of cable, together with the drawing in of cables, and of wires in the conduits; connecting the terminals; the purchasing of poles; the setting of poles complete ready for the wires or cables; the erection of wires or cables on them, together with cross-arms, insulators and fixtures or appurtenances that usually go with them; all the apparatus for the central offices and for protecting the cables and central office lines, such as lightning arresters, &c.; the furnishing of the instruments; the subscrib-

1135 ers' telephones, commonly called putting them in place; and even to the extent of operating such a plant when we have built it complete, as we have done in some cases, upon contracts for a period of about thirty days after the work was primarily finished. I say "primarily." A telephone exchange may be built complete for two hundred telephones or three hundred and thereafter they may add others to it from time to time.

Q. Are you familiar with the city of Washington and the conditions existing there? A. Yes; I know Washington very well. I know the condition of the streets, the location of the

principal buildings. I have been in a great many of them. Do you mean as to its condition for telephonic service?

Q. Yes. A. Yes; I had occasion to make an estimate. I visited Washington for the purpose of making an estimate upon the cost of a telephone system.

Q. When was that? A. I visited it several times to verify different estimates, but on one occasion in particular about two years ago. Once last year and once year before last I looked the ground over.

Q. Please state upon what kind of plant in dimensions and in ultimate capacity, as well as in present use and present service, you made your estimates? A. We made estimates upon a plant at one time of 3,000 subscribers, installed com-
1136 plete, including an excess cable capacity of 1,000 subscribers and an excess conduit capacity beyond that of 1,000, or 5,000 for the latter. This included in the 3,000 subscribers everything that was necessary to be done to place 3,000 subscribers' telephones in full operation under first-class modern circumstances.

Q. In what way did you determine the direction and the extent of conduits, and what part of the city was covered by the conduit system? A. We started from a central point, approximating a distance within 1,000 feet from the corner of F street and 14th. The conduit system was laid out with the idea of being capable of carrying cables in each direction from the point indicated in the main part of the city, and provided for conduits throughout the main portion of what would be called the down-town district or business district. I do not know that you would call it the down-town district there. From a Chicago point of view we would call it down town, wherever the business district is.

Q. What did you contemplate in the way of overhead construction? A. The main lines leading to residence sections from the business section had some amount of conduit work figured with them. We could conduit to certain residence districts, not all of them, where more than one hundred pairs of wires were involved in that line. On the branches from
1137 these conduits throughout the residence district, and through the alleys in some portions of the business district it was calculated that poles could be erected for distribution of the wires from their terminals to the subscribers.

Q. Mr. Keelyn, what was your estimate of cost for that system built in that way you have mentioned? A. Before answering that question I would like to have my other answer more fully understood. To make this more clear, I would say that modern telephone practice has developed the belief that underground construction well accomplished is better for telephone

service than overhead construction. The tendency in this direction, in all recent first-class telephone exchange work, led us at the time of making the determinations, in Washington, to contemplate a much larger amount of cable work and conduit work there than appeared to be in Washington at the time. I did not catch your other question.

Q. What was your estimate of the cost of that system, at what price it could be furnished by you complete? A. At less than $450,000.

Q. Have you had occasion to determine in your experience the cost of maintaining, in an economical and yet efficient way, telephone exchange plants of the kind you have just described? A. Just such a plant as I have described in particular, I should say not precisely; but I have had experience with telephone exchanges and their operation; I am familiar
1138 with the cost of operation and expenditures generally for the construction of quite a good many systems, which would lead me to conclude reasonably upon what a plant such as I have described would cost to operate.

Q. What, in your opinion, would be the cost of operating such a plant?

Mr. WORTHINGTON: We object to that question because no sufficient foundation has been laid for having this witness give an opinion on that subject, as it does not appear in fact that he has ever operated an exchange or had personal knowledge of the expense of such operation.

A. Such a system as I have described was estimated to cost in operation—

Mr. WORTHINGTON: I object to this as hearsay.

A. No, sir; these are the determinations made upon it in order to make an estimate of the commercial standing of such a system, in order to consummate a sale of such a plant, which is in the regular line of our business. In calculating upon the cost of construction of a telephone exchange, we are required usually to also give some information as to the reasonable cost of operating it with such a system. The opinion I had at the time of making the estimate and have now is that such a system could be well operated at less than $25 per telephone per annum, and under favorable circumstances and judicious and economical management for such a plant, as low as $12
1139 per telephone per annum. I am not taking into consideration in this connection any interest upon the plant. I am assuming the plant to be without bonded interest, without watered stock, without perquisites or appendages, such as unnecessary officers at high salaries; but upon such a business condition as commercial concerns are usually run.

Q. My question was intended to assume just what you have stated? A. In line with the cost of operation of such telephone exchanges, I might say that we have in our possession the statements of telephone companies operating telephone exchanges, varying in number of public telephones in use from one hundred to one thousand telephones—

Mr. WORTHINGTON: We object to the statement of the witness as to the contents of these statements or anything in relation to any conclusions that he has drawn from them, on the ground that it is hearsay and incompetent evidence.

A. Indicating and asserting that—

By Mr. BIRNEY:

Q. Do the statements you refer to deal with the cost of operating exchanges? A. Yes, sir.

Q. And have you for the purposes of making your estimates consulted those statements? A. Yes, sir.

1140 Q. And acquainted yourself with their contents. A. Yes, sir.

Q. In what other ways have you enabled yourself to express an opinion as to cost? A. By the examination of books of those who have exchanges in operation, by questioning personally those who have made the expenditures, and by a general knowledge of the experience of paying for the operation of telephone exchanges myself operated by me—my own exchanges; having owned in part or wholly and being responsible, for such expenditures in a number of telephone exchanges. I have not taken my whole data from any one telephone exchange, but have assumed that a condition in one telephone exchange definitely would be reasonably a parallel of an expenditure in another, under reasonably like circumstances.

Q. You say you have not included in that estimate dividends, upon stocks, or upon bonds or interest upon capital invested. Have you included all other items of expense, such as operating, maintenance, repairs and the like. A. All other proper charges for maintenance, and some of what would constitute ordinary depreciation. In other words, in carrying a fixed expense account in a telephone exchange, it is quite usual, although a bad custom early begun and now gradually being done away with, to charge against the fixed expense account the labor, for instance, of a man regularly employed, whose time for which he is paid, is employed in the con-

1141 construction of new lines almost if not entirely. That expense, in my opinion, should be charged to improvement account or to plant increase. As stated, it is usual to charge such an expense and many other expenses of a like character to a fixed expense or maintenance account, for the

reason, that in operating a telephone exchange, is is convenient to employ a foreman and two linemen and two inspectors. I wish to illustrate in this connection; although only one lineman and one inspector might be required for the ordinary purposes of well keeping up the lines and telephone instruments of such an exchange, yet the condition of increased business coming to nearly all telephone exchanges warrants the use of the additional lineman and inspector and foreman mentioned, and the number are carried as a rule just the same as if all of them were constantly employed in repairing lines or telephones or in overcoming depreciation; therefore, in figuring upon the expenditures and the costs of operating a telephone system I have calculated just as though these men who had been employed in building new lines were a part of the regular cost of keeping up the regular telephone exchange to a certain extent.

Q. What did you calculate would be the cost of the switchboard and its attendant apparatus for the plant which you designed for Washington? A. Our estimate was within $45,-
000 for the switchboard equipment for 3,000 telephones,
1142 including the central office appurtanances, which would
make it operative in connection with the subscribers' lines, covering all apparatus as we would make it in the shop, all of the necessary interwiring between the jacks and plugs and cords, cross-connecting boards, lightning arresters, power generators, motors, storage batteries, operator's instruments, switch-board batteries, etc., ready to connect with the terminal heads of the cables leading out to the construction work proper?

Q. Did you design to have a single board or more than one? A. We contemplated the switch-board on the basis of 3,000, to be made up either in one central office equipment of 3,000 or in divided central offices of 1,500 in one and the others in two other branches. It was considered that better engineering would obtain with the divided central offices in Washington than with one main office.

Q. Could they be operated by the same power plant? A. So far as the estimate is concerned, if the power plant was divided, it was contemplated that one condition would offset the other; that one power plant could be made to operate both; but that it might be advisable to put divided power
plants into the main and each of the branches.
1143 Q. If two or three switchboards were to be put in, how
would you contemplate connecting them? A. Do you mean from a point of view of operative practice for the operators to interconnect between subscribers in one and in the other?

Q. Yes; by what system? A. By such a system as we have in Newark, for instance. Newark has three branch exchanges and one main exchange. Instead of putting in 3,000 subscribers in one central office in Newark, we divide it up. Between 1,500 and 2,000 of them are placed in one main office. I should qualify that last, so far as our switch-boards are concerned. I mean now that we put in the switch-boards 1,500 lines capacity in the main office. There may be less than 1,500, and possibly between 1,300 and 1,400 subscribers connected with the main switch-board in Newark. The balance are divided up in the other three branch exchanges—two or three hundred in each of them I think.

Q. Is that system of connection what is known as the trunking system? A. Not what is commonly known as the trunking system. With us, we call it a transfer system. It does not involve the re-connecting of additional lines, such as were formerly in practice for trunking purposes. It is simplified very much, and is a particular thing in the production of our apparatus, and rather a novelty with us.

Q. Are you familiar with the trunking system? A. Yes, sir; several forms of trunking systems.

1144 Mr. WILSON: I have not heard yet how the exchanges are connected? A. We would run a line of wires between each exchange, practically forming a link between each operator in one exchange and each operator in the other, or each division of operators in one and each division of operators in the other, as practiced by us. This enables the operator in one exchange to connect a subscriber's line in her exchange with a subscriber's line in another exchange, through the medium of the latter exchange operator. The usual method in the Bell system is to answer a subscriber by putting the plug on one end of a cord into that subscriber's jack and the plug on the other end of the cord into the jack of the subscriber wanted, she having before her a multiple number of jacks of all of the subscribers in that exchange. This practice, up to a certain sized telephone exchange, has in the past been reasonably satisfactory under favorable conditions. However, in the larger cities this multiple jack process is amplified to such extent that it becomes very objectionable, and, as a result, the makers and designers of this multiple switchboard have recently been making switchboards of smaller capacity than they have heretofore attempted, and are providing means for sub-dividing the exchanges as indicated by me we contemplated doing in Washington somewhat. The John street exchange in New York, one of the latest designs of switchboards built for large exchange purposes, con-

1145 templates that the subscriber in that telephone ex-

change is so connected to the switchboard that when he calls the operator in the John street exchange answers him and provides means through another operator to connect him with the subscriber wanted in a removal switchboard or branch exchange. I mention this because it indicates the feasibility of operating a set of telephonic subscribers connected with one switchboard regularly with a set of telephone subscribers connected with a distinctly different switchboard except that two such switchboards may have their interconnections made through a transferring system applicable to their design. We have a distinct system for doing this work which we contemplated using in Washington. It indicates that the subscriber connected with one switchboard might obtain connection with a subscriber in another switchboard, whether both switchboards were located in one room or different buildings miles apart, and almost as much facility as if they were all together as one board.

By Mr. BIRNEY:

Q. What is the largest multiple board you know of in use—single board? A. I am not certain whether the main office of the Chicago Telephone Exchange, or the Cortlandt Street Exchange of the New York Telephone Company are the largest I have ever seen. I have seen both of them, and am not certain by personal examination and count whether they are or are not of 5,000 subscribers capacity; but I have been
1146 informed by those who have been connected with them that that is about the capacity claimed for them.

Q. In this city of Chicago how many different boards are there, to your knowledge. A. The Chicago Telephone Company which operates the Bell system in the city of Chicago, much the same as the Chesapeake and Potomac Telephone Company operates the Bell system in the District of Columbia, has a number of exchanges instead of having all the subscribers connected into one exchange. Our offices here are connected by telephone to what is known as the main office. However, we obtain connection with subscribers in what is known as the Harrison Exchange, Canal, Lake View, Oakland, and possibly other exchanges that I cannot call to mind at this moment, these several exchanges being sub-divisions of the main system of the Chicago Telephone Company, for which service is nominally furnished subscribers at a stated rental charge.

Q. What, in your opinion, is the relative efficiency, and promptness, particularly, of the service over the single multiple board and over the divided boards connected with the trunking system? A. I have already stated a parallel exami-

nation of two systems; one, our system, a sub-divided system at Newark, N. J., the other a main office system at Newark, N. J., the latter the Bell system, somewhat the same as that in use by the Chesapeake and Potomac Telephone Company in Washington, D. C., except that my examination and information indicates that it is of a later type and of a better
1147 system, by reports of the Bell experts.

Q. Aside from those particular examples, what do you say? A. That examination, as stated, proved to my mind and satisfaction that the sub-divided system was superior for service, results, generally speaking.

Q. You have spoken of a transfer equipment being necessary. Can you approximate the size of such a transfer equipment between two exchanges of, say, 1,500 each? A. Do you mean the comparative number of lines between? I do not quite understand you.

Q. As I understood, there is a fixture, or space necessarily occupied by some fixture, used for transfer purposes in an exchange building. How much space would be occupied in that way? A. The space actually occupied by the operators and the transfer boards contemplating connection for 2,100 subscribers. In the main office of Newark, N. J., and the branch offices, four in number, three in existence and one to be established, the space occupied on the floor in front of the main switchboards is not to exceed ten feet in length by five feet in width and six feet in height. I am giving the dimensions from memory and I believe the space occupied is considerably less. I can give the absolute measurements from the blue prints here if it is desired.

Q. What is the proportion of additional operators
1148 necessary under the divided board system? A. We use ten per cent or less, depending upon the time of operation. During some of the busy hours it uses nearly ten per cent additional, and at other times, being about one-half of the time, no additional service. In other words, the operator normally used at the transfer board during times of the day is relieved from operating the trunking board or transfer board and takes her place with the regular operators, who are able to take care of the general business without additional substitutes.

Q. Who then would operate the transfer board? A. They are enabled, by the design of switchboard we make, to rearrange readily the transfer connections to positions in the main board, so that the operators at the main board may do this work themselves when the exchange is not extremely busy; at night, for instance. I would like to say that transferring connections between subscribers in one exchange and those

in another exchange has been given a great deal of thought by myself and by the engineering department of this concern. We have believed that the evolution of the telephone business would require subdivision of telephone exchanges, and therefore devices which would give facility of operating under subdivided switchboard circumstances; that, for instance, the business of the Milwaukee Telephone Exchange, within itself of today would not equal the telephone business of the Milwaukee Telephone Exchange outside of Milwaukee twenty-five years hence, basing our belief upon the reason-
1149 able advance of telephone work as now going on. In other words, the total amount of intercommunication in the city of Milwaukee, by its respective citizens within the limits at present, is no greater than the total amount of business of interconnecting with other places may reasonably be expected to be within twenty-five years from now. In other words, not the business of Milwaukee with other places alone, but the necessary business of the tributary lines leading into Milwaukee, and which, of necessity, will find their nucleus there for connection with other cities throughout the world.

By Mr. BIRNEY:

Q. Mr. Keelyn, have you informed yourself of the rates charged for telephone service by independent companies, that is to say, companies operating not under the Bell system of patents, in the Western States, say in Indiana and Illinois? A. Yes, sir.

Q. Please state, if you will, in a general way, what they are? What are the highest rates known to you in those States? A. I am not familiar with any telephone exchange independent of what are known as Bell Telephone Exchanges where the rate charged is higher than $50 per annum per telephone, although I am familiar with a great many telephone exchanges independent of what is called the Bell telephone system,
1150 Q. Are you able to state what is, in your opinion, the average rate charged for business telephones in those independent exchanges in Indiana and Illinois? A. I should say that the average rate for business telephones, and my statement is based upon information which would include personal conversations with those who have established them, and letters received from those who are operating them—

Mr. WORTHINGTON: All this is objected to as hearsay.

The WITNESS: That the average rate for business telephones by the independent telephone exchanges of Indiana and Illinois, for instance, would not exceed $24 per annum per telephone, and would not exceed $18 per annum for residences.

Q. Can you approximate the number of such exchanges in existence in those States? A. There are about 300 systems operating independently of the Bell in the States of Indiana and Illinois combined.

Q. Are you familiar with the Fort Wayne plant? A. Yes, sir; I am personally familiar with it.

Q. How long ago was that established, and by whom? A. About three years ago Mr. George W. Beers took up the matter of building a telephone exchange independent of the Bell in Fort Wayne, Indiana, at the instance of myself and a number of users of telephones in Fort Wayne who were dissatisfied with the Bell service.

1151 Q. Did your company construct the system? A. A. great deal of it. We assisted them in getting their organization in shape, getting their franchises, laying out their work, underground and overhead. We gave them estimates and data upon which to base their operations; we informed them of my opinion, as I have given it to this commission, of the probable cost of operation of their plant, the cost of construction of it, and sold to them the apparatus and equipment for it finally, and have since continued to do business with them in such close manner that we might be said to be almost entirely familiar with their affairs. With respect to the rates charged, I could not speak definitely without a frequent and continued examination of each book item or a personal investigation in particular instances as to whether a subscriber is paying this or paying that or the general price.

Q. How large is that business; that is to say, how many telephones are in use there? A. About 2,000.

Q. Is it an overhead or an underground construction? A. It is partly underground and partly overhead, as nearly all telephone systems are.

Q. What proportion does the underground system bear to the whole, as nearly as you can estimate? A. The main part of the city is covered with underground conduits. Their main lines are carried underground.

1152 Q. What are the rates charged for telephone service in Fort Wayne by the company you have spoken of? A. The regular rates, as established for the use of business telephones, is $36 per annum for unlimited service long distance telephones, metallic circuit lines; for residence telephones upon the same character of lines and instruments, $24 per annum; and where a subscriber to a business telephone has one in his residence also the combined rate is made $48 per annum for two, or $36 per annum for the business telephone and $12 per annum for the residence telephone.

Q. What do you know of the financial results of their operations, and how have you obtained your information?

Mr. WORTHINGTON: I object to this witness's testimony about the financial rates and the financial affairs of the Fort Wayne Company, because it is manifest he knows it only from hearsay.

A. In selling them the plant I personally looked into their finances; determined that they would be able to pay us for what they purchased; gave them credit for an amount of money to begin with, which, of practical necessity, their earn-
1153 ings would meet to pay off; placed myself in a position of obtaining information as to the conduct of their business, the payment by the subscribers of the rentals; and have particularly informed myself from time to time as to their respective income in excess of their disbursements for operating purposes; have their reports on file, showing the varied extensions, improvements, expenditures and payments; and from this and other information—

Mr. WORTHINGTON: I again object to all this testimony as being still more evidently hearsay and incompetent.

A. Including the payment to us, which passed through my hands to the credits allowed, and the continued orders and the payments for shipments of apparatus purchased through these orders, and the statements of subscribers as to what they were paying; the examination of employes as to what they were being paid; I have gained a general information which I think would place me in a position to say positively, as well as one can pass upon the success of any telephone exchange, that it has been a substantial success; has paid two per cent cash quarterly dividends during its existence; is clear of debt, excepting possibly for small current accounts, and its stock has increased in value above par value, continually since its establishment.

Q. What is the amount of its capital stock; do you know? A. I do not know what the capital stock of the plant is at
1154 present. That is, I do not know the actual issue of the stock, nor the actual capital issued at their last meeting. They have continually increased the capital stock, as they have grown. The exchange started in with 800 subscribers in competition with the Bell Exchange of 1,100 subscribers. It has grown to more than double its original capacity since starting, and its owners have asserted to me their full satisfaction—

Mr. WORTHINGTON: Objected to again as hearsay.

A. With the profit, and in order to obtain credit from me as an officer of this concern, and impressed upon me by their statements and showing that it was a full success as a profitable enterprise, and as satisfactory to the public sufficient to warrant a belief that it would be in the future. I wish to say upon this, so that it will be understood, that the very nature of our

connection with it is such that while we may not have the facility for examining each dollar of expenditure particularly or each dollar of income particularly, that it has been our mission and rule for our own safety and for our own prosperity with respect to a continuance of its further business to inform ourselves specially as to its success, as to its profits, and as to the satisfaction the subscribers in Fort Wayne have had with the system. I have had our agents make examinations and report frequently to me. I have personally gone in and used the telephones of subscribers in the city of Fort Wayne, and called for connections just as they would, hundreds and hundreds of times, more than 200 times, I should say, within the past two years. I have talked with a great number of subscribers
1155 in Fort Wayne, I should say not less than two hundred of them in the different times within two years, as to the respective service of the Fort Wayne Telephone Company, or, rather, the Home Telephone and Telegraph Company, the corporation now using our system, and the subscribers using the Bell system, with a particular view of determining whether those in one system or those in the other were best satisfied, and its effect upon the success of our system. I have talked with officers of the Fort Wayne Telephone Company, and have asked and been informed by them of its success.

Mr. WORTHINGTON: Objected to again as hearsay.

A. I have examined the papers submitted to me by them, showing the rates, number of subscribers and approximate disbursements at times, sufficiently to convince me that its financial success is not problematical, but assured.

Cross-examination.

By Mr. WORTHINGTON:

Q. Does the Western Telephone Construction Company keep a regular set of books, showing its transactions with the various parties with whom it has financial dealings? A. Yes, sir.

Q. Have you, as the president of that company, the control of the books? A. I have full access to them, under the
1156 order of the board of directors.

Q. Are they in this building in which this testimony is now being taken? A. I presume a great number of them are.

Q. Have you here books which will show the accounts between this company and the Fort Wayne Company, of which you have been speaking? A. I believe that we have books containing some of the accounts of which I have made mention.

Q. Where are the books containing the others? A. I have made mention of some of the papers and accounts in speaking of the Fort Wayne showing, as having been seen at Fort Wayne.

Q. But do your books show all the financial transactions between your company and that company? A. I believe most of the financial transactions between the Fort Wayne Company and the Western Telephone Construction Company would be shown upon their books.

Q. What is the name of the Fort Wayne Company? A. There are three telephone companies at Fort Wayne, interoperating the system. There is the Fort Wayne Telephone Company, which was in operation there, and the Home Telephone and Telegraph Company, which is in operation there. My impression is that the plant of the one was absorbed by the other.

Q. Do you not know enough about their affairs to know whether one corporation or two is running that exchange now?

A. I think one corporation is operating that exchange
1157 at present.

Q. But you are not certain that one corporation operates it entirely. What is the name of the corporation that you think is principally in charge there? A. The Home Telephone and Telegraph Company.

Q. Which company does your company have its financial dealings with? A. The Home Telephone and Telegraph Company at present.

Q. You said there have been three companies there. You have mentioned but two. What is the other one? A. The National Telephone and Telegraph Company.

Q. What has that to do with the Fort Wayne exchange? A. As a connecting system with it. It operates long distance lines in connection with it.

Q. I understand your testimony has been addressed to the local company owning the local exchange? A. Yes, sir; particularly.

Q. That is the Home Telegraph and Telephone Company? A. Yes, sir.

Q. Has your company had any financial dealings with either of the other companies? A. Yes, sir; with both of them.

Q. In what way? A. We have furnished apparatus and sold equipment and materials.

Q. You have spoken of assisting a Fort Wayne Company to obtain its franchise, and of having assisted them in de-
1158 vising a plan for laying their conduits and erecting their plant generally. You have also spoken of their business being a success. Were you referring to some particular company or to more than one? A. I might say that I was referring to both the Fort Wayne Telephone Company and the Home Telephone and Telegraph Company. As I said, I believe the Telephone and Telegraph Company have absorbed the plant

established originally by the Fort Wayne Telephone Company. I think the Fort Wayne Telephone Company originally established the plant and completed it, and then the Home Telephone and Telegraph Company purchased it, and are the operating company at present.

Q. Do you know why if the business was such a success the first company sold out to the second company or transferred its business to the second? A. I don't know why they did.

Q. I thought you, for your own security and that of your company, had made yourself very familiar with the details of this company's business. How did you come not to be acquainted with such an important fact as that? A. I don't think it would have been necessary for us to find out why they sold from one company to the other in order to inform ourselves whether they were good for what they purchased or not.

Q. Have you upon the books of your company, of which you are president, accounts showing the dealings of your company both with the Fort Wayne Telephone and the Home
1159 Telephone and Telegraph Company? A. Yes, sir.

Q. Will you produce those books and let us look at those accounts? A. I rather doubt the advisability of looking into the accounts as they would stand in the books. If there is any particular thing about it, that would make a difference. Unless I am forced by some legal condition to do it, I do not believe I would want to expose the general accounts of the Fort Wayne Telephone Company with us to examination. I do not believe I would refuse to allow an examination of any specific thing that had relation to my testimony.

Q. Our request is to examine the whole of the account of those two companies with your company, not to look at specific items, and the purpose of it is to see to what extent, if at all, the accounts themselves will sustain the account that you have given of those dealings. A. It is a long story to look at those books, the vouchers, etc. We have done business with them for three years. I don't object to anything that would seem reasonable and necessary, and I don't even want to object to any part of it that will come within the range of facility. I would like to talk with our Mr. McRoberts, my attorney, who is here in the office all the time as a rule, and find out whether that is a thing that would be necessary to this. I do not know at this moment anything that I would object particularly to your examining, except upon the broad ground that I
1160 do not think it is good policy or ought to be right for a manufacturing concern of this kind to expose its entire transactions to the view of the court, excepting where those entire transactions form a necessary part of the examination.

Q. You understand we do not ask to look at anything in your

books except that which relates directly to your affairs with these two companies in Fort Wayne. We have no desire to look at anything relating to any other matter, and would be content in the first instance, certainly, if not altogether, to examine simply the ledger accounts with those two companies. A. I should like to advise with our attorney, Mr. Worthington, before answering.

Q. Now? A. I will try now and see if I can get hold of him; and in order to do that I would like to have him know what my testimony is upon these points, so as to give an intelligent response or objection to it.

Q. Then if it will be convenient, you can do that to-morrow. A. If you will wait I will try now, or I will do it to-morrow morning, just as you choose.

Q. Just as you choose. We have a good many other questions which can be asked you which we can go on with to-night.

A. I will ask him.

1161 (At this point the witness retired a few minutes, and now returning, states that his own business will require his attention for the remainder of the evening, it being now 5 o'clock, and asks that the further examination be postponed until to-morrow.)

The further taking of these depositions was thereupon adjourned until Tuesday, January 17, 1899, at 10 o'clock a. m., at the same place.

1162 Office of the Western Telephone Construction Co.,

250-4 South Clinton street, Chicago, Ill.,

Tuesday, January 17, 1899, 10 o'clock a. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney.

Present on the defendant, Mr. Wilson and Mr. Worthington.

Present, also, Mr. Isaiah W. Farnham, a witness examined heretofore on behalf of the defendant in this cause.

Cross-examination of JAMES E. KEELYN resumed.

The WITNESS: In order to furnish what you might ask for reasonably in the way of books, I would prefer a rather more specific request. The request was a general one, and said, "all matters relating to the accounts of the Fort Wayne Telephone Company or the Home Telephone and Telegraph Company," as I understood it. "All matters relating to their accounts" would involve other matters also in relation to our affairs outside of

the accounts. I am willing to offer the books for examin-
1163 ation with respect to the accounts, and will tender the accounts on the ledgers for examination; but if anything further is needed I would like to know particularly what it is, so that I shall be prepared to furnish it. These books include, if you please, other accounts, other matters, than those respecting the accounts of the Fort Wayne Telephone and the Home Telephone and Telegraph Company. I specifically request and exact that no examination be made otherwise.

By Mr. WORTHINGTON:

Q. You mean of no account except these? A. You will be given the indexes by our bookkeeper, who is in charge of them.

Q. And who is here present? A. Who is here present. He will show to you the accounts of the Fort Wayne Telephone and the Home Telephone and Telegraph Company as they appear in these books, and those only, for examination.

Q. Before examining these accounts, will you tell me whether there is any part of the transactions between this company of which you are president, and those two companies at Fort Wayne or either of them, concerning which you are unwilling to let us see what your books will show?

Mr. BIRNEY: Objected to, unless counsel makes more specific his inquiry.

Mr. WORTHINGTON: I will state for the information of coun-
sel for the complainants and of the witness that I am
1164 unable to make that question specific, because I do not know yet whether there is anything in relation to the transactions referred to which the witness desires to conceal, or, if there is, what part? That is what I want to find out. A. I am not aware at this moment of any matters pertaining to the investigation of this committee, as shown by my examination thus far, that would require concealment upon my part or the part of this company represented by me, pertaining to the accounts as indicated by the general request, as I understood it, for presentation of the accounts between my company and the Fort Wayne Company and The Home Telephone and Telegraph Company. It is not with a view of concealing anything that I have requested a specific statement by counsel for the defendant.

Q. Has your company at any time held or owned any of the stock of either of those Fort Wayne Companies? A. No.

Q. Have you individually? A. No.

Q. Has anybody connected with this company? A. I don't know.

Q. Has your company at any time held any bonds issued by either of those Fort Wayne Companies? A. I believe not.

Q. Then you are not certain? A. As certain as I could
1165 be in my position. I think, from belief. I don't believe they have.

Q. Have you? A. No.

Q. Has any person connected with this company? A. I don't know. I reply, "I don't know," to questions where they are asked in a definite manner with relation to people connected with this company. I am not supposed in my position, from my point of view, to know whether or not people connected with this company have private interests that I should know about sufficiently to respond intelligently to the answers of questions in this examination.

Q. You have produced here two ledgers and their respective indexes, one marked Ledger B and the other Ledger C. Do the entries in those two books relating to the accounts of the two Fort Wayne Companies in question cover all the transactions between this company and them or either of them? A. I am not personally familiar with the precise terms in the accounts of the books presented and which are probably referred to in the question. I have assumed that our books were being regularly kept, as is usual in first-class commercial concerns. I have not found it necessary at all times to examine into specific items of charges or credit. I have the belief that these books comprehend a statement of accounts between the Western Telephone Construction Company (my company) and the Fort Wayne Telephone Company and the Home Telephone
1166 and Telegraph Company, as requested by the counsel's demand for the production of such a statement.

Q. Do you know of any other transactions between your company and either of those companies which are entered in any other book and are not in these? A. What other transactions, for instance?

Q. Any? A. I have had occasion to send a salesman to Fort Wayne, or an expert to Fort Wayne, to represent this company in work carried on there. They may have purchased woodwork or carpenter work or screws or hardware or they may have negotiated for the purchase of stationery, pins and needles, and I would have had some knowledge of such transactions and believe that there were some little transactions that are not enumerated sufficiently in these books; and in such a relation other things may have occurred verbally or by correspondence, involving one item of this, that or the other, that I would consider and believe to be of no particular moment. As I understand the inquiry, and therefore express my belief, there are no other material transactions with respect to the accounts between the Western Telephone Construction Company and the Fort Wayne Telephone Company and the Home Telephone

and Telegraph Company that are not comprehended in the statements of the books as I believe they should be, and our rule to charge a credit shows on its face.

Q. Why do you limit your answer to matters of accounts?

A. I have asked the counsel for some specific question,
1167 so that I might answer it intelligently, and as the counsel has taken pains apparently to ask a general question by the broad word "transactions," I am unable to intelligently reply other than as in my previous answer to the question asked.

Q. Has your company a book or books relating to transactions between it and either of the companies at Fort Wayne which are not included or referred to in these two ledgers or either of them? A. I believe not. I asked for the statements of the accounts and all of them between the Fort Wayne Telephone Company and the Home Telephone and Telegraph Company and the Western Telephone Construction Company, my company. I asked this of our bookkeeper, in charge of them, and as he has always in the past been dutiful and truly responsive to my requests, I assume that he has in this instance. Without more specific knowledge of the facts than I have before related having, I believe that the books presented contain the accounts, and all the accounts, between the Fort Wayne Telephone Company and the Home Telephone and Telegraph Company with the Western Telephone Construction Company.

Q. Has your company at any time held the promissory notes or other written obligations of either of those Fort Wayne companies? A. The books should show such transactions.

Q. I ask you for your personal knowledge of it? A. My recollection is that we have held their obligation to pay
1168 either in form of note or otherwise at times.

Q. Do you hold any such obligations now? A. I believe not.

Q. What is your bookkeeper's name, who is here? A. Mr. E. Bradley. I wish to offer an objection on my own part at this moment to the presence at this testimony of a representative of an opposition and competing interest, whose purpose here, I am led to believe from past history, is not friendly, but, on the contrary, unfriendly, to the interests of this company.

Q. To whom do you refer? A. Your expert.

Q. Give his name? A. Mr. Farnham. I further offer objection to the presence at my testimony of Expert Haskins, who represents the Bell Telephone Company, so-called, and who is unfriendly and in opposition to our interests, as shown by other cases in the past.

Q. At the present moment Mr. Haskins is not present, though he has been here, and he is expected soon to return. A.

I do not know that this is in order, but if I am asked any questions about our private affairs, I do not propose to have the representatives of the Bell Telephone Company present if I can avoid it reasonably and decently, outside of their counsel.

Q. This testimony happens to be taken here in your office by consent of counsel, and I would like to ask whether you propose to take any advantage of that fact to exclude from
1169 this office persons whom you could not exclude from another office? A. I have tendered the offices of this company for the use of the commission in taking their testimony. We shall offer them every courtesy of the premises in that respect. I do not object at all upon those gounds.

(At this point Mr. Haskins enters the room.)

Mr. WORTHINGTON: I state that we propose to have Mr. Farnham and Mr. Haskins stay here, as we proceed with the examination.

Mr. BIRNEY: Counsel for the complainants here enters his protest against the presence at the further taking of testimony while the witness is under examination, of Mr. Haskins and Mr. Farnham, and request that they withdraw.

Mr. WORTHINGTON: And we request them to remain. In this connection, I would state that Mr. Farnham's presence here in Chicago was purely accidental; that I met him at the hotel where I am staying yesterday, and was very much suprised to find him, and at first did not recognize him. I will state that he and Mr. Haskins are here at our request, and for the reason that this examination necessarily involves technical details, relating to telephonic apparatus, with which counsel are not and cannot be expected to be as familiar as those who have made it a study, and have had great experience in it. We asked them to come here so as to give us information as the examination proceeds in relation to those matters, and we state that we propose to have they stay here or go out with them.

1170 The WITNESS: There is no objection upon the part of the witness nor the Western Telephone Construction Company to the presence upon the premises or in the offices of this company of the gentleman referred to, and the objection I make was purely one of being present in this room during the time of taking testimony and listening to the same of the witness in the examination, particularly of the books of the witness's company in their private relation; and no objection whatever is made to the presence of the experts named, Messrs. Farnham and Haskins, upon the premises other than that. It is purely an objection to their being informed upon our private affairs.

By Mr. WORTHINGTON:

Q. I presume you know, Mr. Keelyn, that this testimony is all to be written out and becomes a part of a public record in a court. You are aware of that, are you? A. I understand that; yes, sir.

Q. Mr. Keelyn, will you please produce the account of the Fort Wayne Telephone Company in Ledger B, and let us look at it.

(Witness does as requested.)

Mr. WORTHINGTON: On page 307 appears the following account:

The WITNESS: I object to a copy of the accounts of this company going into this record in detail, because the publication thereof and the information contained therein is not nec-
1171 essary for the purposes of the defendant's examination of myself or corroborative thereof or in conflict therewith. The counsel should state before further detail of these accounts what his specific purpose is in asking for them.

Mr. WORTHINGTON: Counsel distinctly refuses to inform this witness what his purpose is in offering this account, and requests the examiner to proceed with the copy.

Mr. BIRNEY: Counsel for the complainants protest the methods employed by counsel for defendant in this matter as unfair and improper.

Mr. WILSON: Will you please state wherein they are unfair.

Mr. BIRNEY: Yes; if you want it.

Mr. WILSON: We want it.

Mr. BIRNEY: Because it appears from the account, as exhibited to counsel for defendant, that it is a closed account, no liability whatever remaining upon the Fort Wayne Company to the Western Telephone Construction Company, and because it cannot in any way affect the testimony already given by the witness.

Mr. WORTHINGTON: Please proceed with the copy, Mr. Examiner.

The above-mentioned account is as follows:

FORT WAYNE, IND.

1896.			896.			
June	30	S.B.217 20,290.00	May	15	By cash 316	2000.00
	6	S.B.228 81.00	June	18	" " 31	2500.00
	13	S.B.240 75.00	July	17	" " 36	2500.00
		10.				
	28	S.B.261 3.0913.09		31	J.B/R 362	3000.00
Aug.	5	S.B.274 339.24	Aug.	3	By Cash 41	2000.00
	"	S.B.301 4.30		22	J.[Cash King] 378	35.00
	8	S.B.303 105.11		27	By Cash 46	5000.000
	"	S.B.306 94.20	Oct.	1	" J 412	339.24
	24	S.B.294 35.75		1	" " "	3.20
	31	S.B.302 20.25	Nov.	4	" Cash [King] 57	15.00
	11	S.B.315 12.00			" Folio 325	8908.80
	14	S.B. " 60.00				
	19	S.B. 6.60				
	22	S.B.316 15.00				
Sept.	3	S.B.311 2.50				
	11	S.B.338 2116.00				
	16	S.B.320 96.52				
	30	S.B.334 100.00				
Oct.	7	S.B.346 689.00				
	8	S.B.346 689.00				
	10	S.B.346 609.50				
	12	S.B.348 689.00				
	17	S.B.355 30.25				
	24	S.B.360 21.00				
	31	S.B.366 42.67				
	31	S.B. " 64.26				
		26,301.24				26301.24

Ledger "B"

1173 By Mr. WORTHINGTON:

Q. Is there any other account in this book with that company? A. Yes, sir.

(The witness also indicates pages 325 and 326.)

By Mr. WORTHINGTON:

Q. Mr. Keelyn, what does S. B. mean in these accounts, if you know. A. I am not familiar with the characters.

Q. Will you inquire of your bookkeeper here present, and let us know, that we may determine what these things mean? A. I can make the inquiry for you.

Q. Will you ask him what it means? I ask you to do so because it appears on one side of this account in every item in the accoount, so far as I have seen. A. I suppose it means "sale book."

Q. I perceive that the first item in this account on page 307 is: "1896, June 30. To S. B., $20,290.00." The first entry on the other side of the account is "May 15. By cash $2,000.00." Are these the first entries in your book of any financial transactions with the Fort Wayne Telephone Company? A. That I do not recall. I have tendered the books as they appear, and have answered heretofore as to my information upon the books, assuming the books show the transactions of accounts between the companies.

1174 Q. My question is whether there are any accounts in your books of an earlier date than these? A. I could not tell you.

Q. Will you inquire of your bookkeeper here present, and let us know, as we do not desire to rummage through the books ourselves.

(The witness inquires of his bookkeeper whether he is familiar with any financial transactions previous to that, and the bookkeeper says he is not.)

Q. What is indicated by the entry: "June 30, 1896. To S. B. $20,290.00." Does that mean you sold the material to that amount on that date? A. Very likely. I think it was.

Q. I find on the other side of the account that there are two entries to the credit of the Fort Wayne Telephone Company, one of $2,000 on the 15th day of May, 1896, and one of $2,500 on the 18th day of June, 1896, both earlier in date than the charge for material furnished on the 30th of June. Do you know how that happened? A. Yes; the telephone companies, independent of the Bell, with which we have had to do, as a rule, have had sufficient money and financial standing to begin with to be able to pay us a cash amount in advance of shipments, or at the time of making contracts. In the specific case mentioned, this is shown by a payment at the time of making the contract, of the sum of $2,000, I believe, if my recollection serves me right.

1175 Q. Have you that contract here? A. I presume the contract is among the papers of the company.

Q. It should be easily accessible, should it not? A. No, it is not easily accessible.

Q. Why? A. We have thousands and thousands of contracts filed away among our papers, possibly one hundred thousand papers among our files. It is not easy to get out vouchers or old accounts which have been clearly settled by the books, which are the true evidence in our estimation of the standing of an account of this company.

Q. Do you mean to say the contracts which you enter into with corporations throughout the country for erecting telephone plants are not preserved here and kept in regular order

so that you can find them when you want them? A. We try to preserve them with such regularity of order as our facilities will admit. We find very frequently that they are mislaid or out of the way. I am unable to say how difficult a matter it would be to find the contract if it is still in existence, and therefore answer that it might be difficult and would not be an easy task probably.

Q. Who has charge of those papers under you? A. Various employes in the office.

Q. Who is the principal person in charge of the room
1176 where this contract should be? A. I would like to understand more clearly what counsel means. Our papers are kept in various rooms. What rooms this contract may be in, I do not know at this moment. Whether it is filed in the vaults among other papers or is filed away among other papers in different parts of the building, I cannot say. I do not know precisely in whose especial care the paper may be at this time.

Q. If you wanted that paper for your own use at the present moment, what would you do about getting it, Mr. Keelyn?

Mr. BIRNEY: Objected to as entirely immaterial and unimportant.

A. I do not think I can answer a question asking me what my method of doing business is.

Q. We now request you to produce that paper for our inspection.

Mr. BIRNEY: Counsel for commplainants suggests to the witness that he is under no obligation to do so.

Mr. WORTHINGTON: In view of the statement to the witness, I would state that we expected to show by the contract when it is produced, that the witness' testimony in regard to the arrangements between that company and this one are not full and accurate.

The WITNESS: I refuse to furnish the private papers of this corporation, covering other matters than that upon
1177 which I have testified for the inspection of the experts present, or of the counsel for the other side, or anyone else, who I do not think ought to see them.

Mr. WORTHINGTON: Counsel for the defendant state as to the objection of the witness that he does not want certain persons to see the contracts, that we want it for the purpose of putting it in evidence, and will put it in evidence.

By Mr. WORTHINGTON:

Q. Why is it that you are willing to come here and testify for one side to this controversy as to transactions between your

company and the Fort Wayne Company and are unwilling at the request of the other side to make a full disclosure of those transactions by the writings themselves. A. The question avers a supposition which I would express my difference with. I have offered to testify in this matter, and have not sought to testify improperly. I have been willing, and would be glad to furnish such evidence as I could furnish or could have furnished, for the purpose of this commission, so far as the same did not appear to me to offer an injury to our business, and appear at the same time to be unnecessary in order to get at such facts as I have been asked to give testimony upon. The private papers of a corporation of this kind frequently contain matters, information that in the hands of competitors would be a commercial detriment to it. My right to protect myself and my business against an arbitrary, offensive, and what appears to me unnecessary, prying into our pri-
1178 vate affairs, leads me to refuse to go any further in this direction than the court or legal process would require me to.

Q. Would that contract if produced show the prices that you were to receive from the Fort Wayne Telephone Company for the telephone apparatus which you were to furnish it? A. I believe that the price in the contract would show the prices the same as they appear in the books. I have no reason for believing that they would not show the same in the books that they would in the face of the contract; and it is not for the purpose of hiding any such facts that I have objected to searching and going to the great difficulty of getting the specific paper called a contract referred to. The contract might contain matters, and undoubtedly does contain matters, of a private nature, showing our particular method of doing business with our customers, both as to form of language, etc.; but I do not believe the contract with respect to the enumeration of its figures, or the articles to be furnished, differs from the showing in the books upon the material furnished under the contract, and that charged for in the books.

Mr. WORTHINGTON: I object to so much of the witness's answer as undertakes to state what the contract would show in reference to prices, as he is stating the contents of a paper which he refuses to produce and stating what he believes to be true, when according to his testimony, it is not even certain that he can find it.

1179 By Mr. WORTHINGTON:

Q. In this first entry upon the debit side of the account of the Fort Wayne Telephone Company, "June 30, 1896, $20,290.00," there are the figures 217. I presume that refers to a journal entry, does it? A. That refers to the sales book.

Q. Will you please produce that salesbook so that we may look in it at that original entry? A. What object has the counsel in asking the question or making the demand?

Q. I decline to take the witness stand and answer that or any other question in relation to our purpose of conducting this cross-examination. A. Is it necessary for the purpose of information that that book should be presented in order to verify those figures?

Q. I consider it necessary for the purpose of the defendant, whom I represent in this case, to call for that entry; and, generally, I claim the right on cross-examination to produce the writings relating to the transactions concerning which you have given your recollection on your direct examination.

1180 The WITNESS: To the bookkeeper. Is that salesbook where you can get at it?

The BOOKEEPER: Not very readily.

A. These books are rather difficult of getting at. I shall ask for sufficient indulgence to inform myself whether the book can be gotten at within reasonable effort for the purpose of examination. We should have to make a search to get these books. These accounts are closed accounts, and are relegated to our historical archives. We very likely could get them by a search, but as they are among a large number of other papers, and I do not wish to object to furnishing books showing this item, upon any ground of secretion of the items therein, but upon the ground of inconvenience in getting the physical thing itself, the salesbook, showing the items before the commission at this time.

Q. Very well; we will wait until you have made such examination as you desire to make. A. If you will give me long enough, I will investigate it.

(At this point the witness retired from the room. The bookkeeper also retired. Both the witness and the bookkeeper subsequently returned.)

Mr. WORTHINGTON: Counsel for defendant states that in view of the suggestions made by the witness, Mr. Haskins and Mr. Farnham have retired from the room and will not be present during any examination of the books of the witness' company.

1181 The WITNESS: We are unable at this time to determine just how long it would take us to get these books. It would require a search of books and papers on the premises to produce them. In respect to the item under consideration I now offer to furnish a certified copy of said item, as shown by the books when we can obtain them for examination. I

make this offer, not knowing whether it is desired, but in good faith, indicating that it is not our purpose to hide from the investigation the matter which we understand is required; that is, the salesbook item for which the ledger entry is made.

Q. How long have you and your assistants been searching for the salesbook, the book which we requested you to produce? A. Several minutes.

Mr. WORTHINGTON: I now request the examiner to make a copy of this account, which appears upon ledger B, page 325-326.

Mr. BIRNEY: Counsel for the complainants objects to the offering of the account in evidence as being utterly immaterial, and not connected in any way with the examination in chief.

The above entry is as follows:

1182 FORT WAYNE TELEPHONE CO.

FORT WAYNE, IND.

1896.				1896.				
Nov. 15	To Bal. Fo.	307	8908.80	Nov. 30	By JB/R	432	4792.50
16	To Cash	58	1.02	30	" J	"	893.59
				Dec. 1	" Cash	62	3052.73
				18	" J	448	90.00
				31	" J	452	81.00

Ledger "B."

1183 FORT WAYNE TELEPHONE CO.

FORT WAYNE, IND.

1896				1896			
Nov. 15	To S. B. 369		35.00	Dec. 19	By J. 12-12	448	12.75.
				1897			
26	" S. B. 394		60.25	Jan. 1	" Ledger C	260	97.30.
12	" S. B. 12		15.00				

Ledger "B."

1184 By Mr. WORTHINGTON:

Q. When was it that the Fort Wayne Telephone Company transferred the exchange at Fort Wayne to the Home Telephone and Telegraph Company? A. I can't state the exact date.

Q. State it as nearly as you can. A. Within three years.

Q. I notice that on the credit side of this account, on page 307, some entries are "by cash" and some "by J." What does "J" mean there? A. I think that "J" is a character to signify "Journal," and would add for your information that "C" is probably "cash."

Q. Among these entries are these: July 3, 1896, by J, $3.000; November 30, 1896, by J, $4,792.50; November 30, 1896, by J, $893.59. Would the journal entries referred to there show in what manner that credit was obtained? T. They might and they might not, fully.

Q. Is the journal here referred to by the letter "J" a different book from the one indicated by the letters "S. B?" A. I am unable to say without investigation.

Q. Your bookkeeper is right here, is he not? Can you not find out from him? A. I imagine that he would not be able to tell without investigation.

1185 Q. Will you inform yourself, then, and let me know? A. It would require about as much of a task for me to inform myself so as to answer this question with such certainty as the counsel demands as to investigate and find the books and personally look into them. That is such a physical difficulty at this time that it would be very difficult.

Q. Do you desire the court in Washington that is to determine this case to understand that you cannot find out what that letter J means that runs through all this ledger of 1892 without any great amount of time or effort? A. I mean that it will take some time, and how much time I am unable to say at this moment. I have explained that the books and papers of these closed accounts are at places in our premises, in the files or elsewhere, undoubtedly, and that it would require a search for me to determine where they were and then determine from them whether the particular J or journal on one entry is the same journal covering the J offsetting another entry.

Q. My question is simply whether the book which is referred to on the debit side of this account by S. B. is the same book which is referred to on the credit side by the letter J or a different book? A. Maybe I can learn by some inquiry sufficient to satisfy the counsel. (Addressing the bookkeeper.) Are those the same book, do you suppose?

The BOOKKEEPER: I would not know. It was before
1186 I had anything to do with the accounts at all.

The WITNESS: (To the bookkeeper.) Does it appear to be the same?

The BOOKKEEPER: The pages do not agree there. I should take it that they were different.

The WITNESS: I am unable to say from these entries whether the journal represented by the J in one instance is the same journal as represented by J in the other instances. If you ask me for my opinion, I will give you that.

Q. Who is your principal bookkeeper now? A. Mr. Bradley is one of the principal bookkeepers.

Q. How long has he been employed as a bookkeeper here? A. About eight months.

Q. Has he any assistants? A. Yes.

Q. Who are they? A. Mr. Frank Schmidt.

Q. How long has he been with you? A. Two or three years.

Q. Was he here in 1896? A. I believe he was. I am not certain about just the date of his coming.

Q. In whose handwriting is that account with the Fort Wayne Telephone Company, which begins in January, 1896? A. Some of it appears to be in the handwriting, as I would judge it, of Mr. M. B. Kennedy.

1187 Q. Is he with you? A. No, sir; he was at the time these accounts were made, I believe.

Q. In whose handwriting are the entries which are not in Mr. Kennedy's? A. I don't discover any other handwriting that I would recognize.

Q. Could you find out by sending for Mr. Schmidt and inquiring of him what that letter J refers to in that account? A. I don't see any of Mr. Schmidt's handwriting on that account.

Q. Do you not think it likely he, being in your office, one of your bookkeepers at that time, would know what books were kept, and how they were designated in the accounts? A. He might.

Q. Will you inquire of him?

Mr. BIRNEY: Counsel for complainants here advises the witness that he is under no obligation to inform himself on the the subject.

A. I don't care to ask for the information.

Q. You decline to do so? A. I decline to do so.

Q. Please look at that part of the accounts with the Fort Wayne Telephone Company which is on pages 325 and 326, and state in whose handwriting they are, being entries in November and December, 1896, and January 1897, including several entries referring to J? A. This appears to be in the

1188 handwriting of Mr. M. B. Kennedy, as I recollect his handwriting. (Referring to page 325.)

Q. Now please look on page 326? A. Those also appear to be in the handwriting of Mr. Kennedy.

Q. Do you know where Mr. Kennedy is now? A. No.

Q. Or where he is employed? A. No, sir.

Q. Does he live in Chicago? A. I don't know. I believe he does.

Q. Are the accounts on the three pages, 307, 325 and 326, all of which are in this ledger B all that relate to the Fort Wayne Telephone Company? A. I don't know. I am not an expert bookkeeper. I don't pretend to keep specific track of our special accounts in detail, nor otherwise, sufficient to state whether these accounts referred to are all or not. The books can speak for themselves.

Q. Is there any account with the Fort Wayne Telephone Company in Ledger C. If so, let us look at it? A. I would like to ask counsel whether I am obliged to furnish these books in detail for examination for the purposes of this case.

Q. Do you mean counsel for the complainants? A. Yes, sir; I understand counsel for defendant is not a witness and not obliged to answer.

1189 Mr. BIRNEY: Counsel for complainants would prefer that Mr. Keelyn should produce the account that is here present. I cannot say that he is under any necessary obligation to do so, as he has not been examined in chief on the subject. A. If it is going to help the defendant in obtaining the information desired, I do not object to furnishing Ledger C, showing the accounts asked for.

Q. Is Ledger C here in the room now? A. Yes, sir.

(The bookkeeper produces Ledger C and exhibits to counsel for defendant the account with the Fort Wayne Telephone Company on that ledger, being at page 262, which counsel for defendant offers in evidence, the same being in the words and figures following, to wit:

1190 FORT WAYNE TELEPHONE CO.

FORT WAYNE, IND.

1897.							
Jan.	1	To Ledger B	326	97 50	Jan. 9	By Cash 68	60.25
	9	" S.B.	41	600.00	9	" J. Nov. 15th 460	25.00
	14	" S.B.	45	600.00	21	" J 438	4.00
	20	" S.B.	52	360.00	22	" J 468	1200.00
	23	" S.B.	56	30.00	30	" J 472	360.00
Feb.	12	" S.B.	82	180.00	Feby 20	" J 488	60.00
May	8	" S.B.	204	780.00	Mch 2	" Cash 56	3.25
	10	" S.B.	235	24.90	Sept 1	" J	942.00
	10	" S.B.	205	1.50			
July	12	" S.B.	299	.50			

Ledger "C."

1191 The WITNESS: I again offer objection to detailing these accounts for public record, while I am willing to show the footings or balances if they are needed.

Mr. BIRNEY: The entries are objected to as being utterly immaterial and irrelevant.

By Mr. WORTHINGTON:

Q. In whose handwriting is this account on page 262 of Ledger C, including a number of references to "J?" A. I would state that my opinion only has been given before upon handwriting, and again will be given in answer to this question, that the handwriting appears to be that of M. B. Kennedy, before mentioned.

Q. Are the books referred to in this account on page 262 as S. B. on the debit side and as "J" on the credit side the same books respectively which were referred to by similar letters in the account of the same company in Ledger B? A. I am not certain.

Q. The last entry in this account on the debit side is dated July 12, 1897, and the next two preceding entries are May 10, 1897, and on the other side of the account the last item is a credit under date of September 1, 1897, of $942. Do these entries enable you to fix more approximately than you have the date when the Fort Wayne Telephone Company transferred its plant and business to the Home Telephone and Telegraph Company? A. While still objecting to the relation of details of the books and items of charges and credits, I would
1192 answer that I have no positive information of the date of transfer. If any transfer has been made of the business of the Fort Wayne Telephone Company to the Home Telephone and Telegraph Company, except that I am led to believe from the fact that our accounts now appear and have so appeared since the time as shown by the books to be in the name of the Home Telephone and Telegraph Company instead of that of the Fort Wayne Telephone Company, that it was about this time a change had been made in the title of ownership in the Fort Wayne telephone exchange.

Q. Did you not testify yesterday that a transfer had been made from the Fort Wayne Company to the Home Telephone and Telegraph Company at Fort Wayne? A. I may have testified that a transfer of the accounts had been made, and that there had been transfers of business in relation to the Fort Wayne Telephone Exchange, between the Fort Wayne Telephone Company and the Home Telephone and Telegraph Company. This testimony I may have given in answer to some question which I do not at this moment recall, but was not intended to assert a positive knowledge of a transfer of the business of the Fort Wayne Telephone Company at a specific time to the Home Telephone and Telegraph Company.

Q. Are you able to say now whether there has been a transfer of any part of the property or business of the Fort Wayne Telephone Company to the Home Telephone and Tele-
1193 graph Company? A. It is my belief that a transfer of the properties and business of the Fort Wayne Telephone Company was made to the Home Telephone and Telegraph Company, and if I have heretofore made a statement to such effect it was with the idea that my best information convinced me that such was the case.

Q. I understood you to testify yesterday that for the protection of your company you had made very particular inquiries

and had obtained very definite information as to the operation of these companies, so as to be able to testify here that they had been making money, and drew conclusions as to their business which could only come from one very well informed on the subject. Do you mean to say that you are not very certain that there was such a transfer from one company to the other, in view of the very particular inquiries you had made and information you obtained? A. I have testified that I believe such a transfer was made.

Q. How? A. I have not witnessed the specific contracts, if there are any, nor specific agreements, if there are any, constituting such a transfer. If such transfer has been made, and yet I believe a transfer of the business of the Fort Wayne Telephone Company was made to the Home Telephone and Telegraph Company, and I have been informed particularly by those connected with the company and their business operations with us in ordering and otherwise in this direc-
1194 tion.

Q. Are you able to tell whether or not the Fort Wayne Telephone Company was sold out under a judicial process? A. Do I understand you to mean that it was sold out by order of court?

Q. Yes; that is what I mean. A. The Fort Wayne Telephone Company's affairs, which I have stated I have been familiar with and kept informed upon, have never at any time been in danger of being sold out by legal process because of weakened financial condition, as the Fort Wayne Telephone Company was constituted with great financial strength. It never was sold out to my knowledge by legal process, and had resources, in my belief, many times in excess of the value of the telephone exchange controlled by it.

Q. What were those resources? A. The financial backing of its membership.

Q. Do you know whether or not the members of that corporation had assumed any personal responsibility for the obligations of the company beyond their subscriptions to the stock? A. I believe that the members of that corporation held themselves in readiness to pay any of its liabilities if necessity required.

Q. Do you know what the resources of that company were, aside from the individual financial responsibility of its
1195 members? A. Not exactly.

Q. Approximately? A. I should say that the Ft. Wayne Company could have obtained credit from this company to the extent of half a million dollars, if this company had that amount of apparatus which it could furnish upon their orders, if they made the orders.

Mr. WORTHINGTON: I object to the entire answer as not responsive to the question, and give notice that I shall move to strike out on that ground.

By Mr. WORTHINGTON:

Q. I ask you to state what were the assets of the Fort Wayne Telephone Company as distinguished from the assets or financial responsibility of those who composed it, if you know? What property did it have, and what was that property worth and what did it owe, for which that property was responsible? A. I cannot at this moment recall specially and particularly what its assets or the liabilities consist of.

Q. Do you know whether it issued any of its stock in the last year it was doing business, and what it received therefor? A. I don't know of its having issued any stock during the period stated.

Q. Do you know whether it did or did not issue any stock during the last year it was doing business? A. I don't
1196 recollect.

Q. Please show me the account in Ledger B, if there is any, of your company with the Home Telephone and Telegraph Company of Fort Wayne? (The bookkeeper referred counsel for the defendant to page 330 of ledger C.)

The WITNESS: I wish to have it appear in the record the responsive suggestion expressed in my language in answer to the counsel inquiry suggesting a possible financial weakness on the part of the Fort Wayne Telephone Company, that I believed and information proved to me that the Fort Wayne Telephone Company was a strong financial institution or concern, holding creditable in its undertaking.

Q. If it was so strong and had established such a good business, why did it go out of business?

Mr. BIRNEY: That is objected to as it already appears that the witness was not a member of that corporation and cannot state its purposes except possibly by hearsay.

Mr. WORTHINGTON: Counsel for defendant state that they agree with counsel for complainants about all of this witness's testimony in relation to the companies in question at Fort Wayne, that it is incompetent, and they have objected to it on that ground; but since he has been allowed to state a great many things which counsel for complainants desire to obtain by hearsay, we desire on cross examination to pursue the same line of inquiry about some other matters, without
1197 waiving our objection to the whole as irrelevant and incompetent? A. I am not informed that the Fort Wayne Telephone Company has gone out of business.

Q. Is that company now engaged in the telephone business at Fort Wayne? A. I do not know, for the reason that considerable time, I should say several months, has passed, since we have had need for informing ourselves of their affairs, or since I have had reason for learning their particular operations.

(In response to the request of counsel for the defendant, the witness produces Ledger C heretofore referred to, and exhibits to counsel for the defendant an account on page 330, headed "Home Telephone and Telegraph Co., Fort Wayne, Ind.," which counsel for defendant offer in evidence, and which is as follows:)

1896.			1897.		
Dec. 21.	To S. B. 22....	43.72	Jan. 1.	By Ledger C 461.	43.72

1198 By Mr. WORTHINGTON:

Q. Please show me the account of this Home Telephone and Telegraph Company at Fort Wayne in ledger C.

(The bookkeeper indicates to counsel for the defendant pages 268, 284 and 290.)

By Mr. WORTHINGTON:

Q. Please show me the account with this Home Telephone and Telegraph Company in ledger D, as I see the account has been transferred to that ledger in October, 1898?

The WITNESS: It appears to me at this moment that ledger D was temporarily left out of this list, because they were working on it.

(In compliance with the request of counsel for the defendant, witness produces ledger D referred to, upon page 465 of which appears an account with the Home Telephone and Telegraph Company of Fort Wayne, Indiana, beginning November 1, 1898, and containing entries down to January 8, 1899.)

Q. I find that in this account with the Home Telephone and Telegraph Company, in ledgers B, C and D, the debit side in apparently every entry refers to a book "S. B." and that the book "J" is referred to down to as late as December 31, 1898. In whose handwriting is that last entry referring to the book "J," dated December 31, 1898? A. I don't know, but I believe it is one of our present bookkeepers.

1199 Q. Which one? A. I don't know.

Q. Do you think there would be any difficulty in producing the books S. B. and J in current use referred to in these accounts? A. We can furnish those right now.

Q. We request you to produce the books known as S. B. and J. in current use, and going back as far as possible? A. I

would like to ask for advice from the complainants' counsel whether if we furnish these books in evidence at this time, the books may be commanded to go out from our offices to Washington, for instance, in continuation of these investigation, so that we might be disappointed and greatly inconvenienced, or inconvenienced in their use in our regular business here.

Mr. BIRNEY: No, sir; that cannot be required.

The WITNESS: Then we will furnish the book.

At this point a recess was taken until 1:30 o'clock P. M.

After recess.

Cross-examination of JAMES E. KEELYN resumed.

The WITNESS: The book of entry, the salesbook containing the item referred to in the demand to see such salesbook, particularly identified by the item of June 16, 1896, has since the morning examination been found. I would rather
1200 have it appear that rather than refuse to furnish any information on this point, I have taken the trouble to look for it and now submit it with the same injunction, that no other examination be made of items not relating to this subject in the book.

(Witness here hands the defendant's counsel a book marked "Journal" at the foot of page 217 of which appears the following entry, which is offered in evidence by counsel for the defendant:

"Fort Wayne Telephone Co., Fort Wayne, Indiana.

"1,000 drop, S. B.
"1,000 W. G. A. 'phones } contract.

"See yellow sheet for details shipment.....	$20,000.00
"Bxg. and cartg. 1,000 'phones, 25c.....	250.00
" " " switchboard	40.00
	$20,290.00"

By Mr. WORTHINGTON:

Q. In this entry, does 1,000 drop S. B. mean 1,000 drop switchboard? A. Yes, sir.

Q. And 1,000 W. G. A. phones——A. I believe it means 1,000 telephones.

Q. What does the W. G. A. mean? A. W. G. A. means the Western Giant "Aid," I believe.

Q. Have you the yellow sheet which is referred to here in this entry for details? A. We might and we might not have. I presume it may be among our own papers.

1201 Q. Then without the contract and the yellow sheet there referred to, no details appear on the papers? A. As much detail appears there as we would usually fill out for the information of the customer.

Q. Mr. Keelyn, what we are trying to get at is to see the articles which were included in that shipment and the price at which each article was billed; and we are no nearer to that now than we were when we started with the ledger? A. The articles have long since passed out of our possession.

Q. Certainly the articles have, but the entries which show what you sent out at that time, and what you charged for the different articles have not gone out of your possession, have they? A. Those books there show that. They show, for instance, that 1,000 telephones, Western Giant "A" telephones and a 1,000 drop switchboard was sent.

Q. But it does not show how much you have charged for the board and how much for the telephones, or whether the telephones were all at the same price or different prices. A. The entry shows that the two were charged together in that instance at one gross price. The detailed sheets, if there are any left, would not give any more light upon the question of how much each was charged for separately judging from the entry.

1202 Q. Then the contract or the yellow sheet, or either of them, would throw a good deal of light upon that subject, would they not? A. The yellow sheet might show this: the different times at which each portion of the total number of telephones were shipped, as they were probably not all shipped at one time. It being impracticable to ship such a large number of instruments in one shipment from our premises, it is usual to keep a supplemental sheet showing the separate shipments in portions which might constitute the whole shipment.

Q. Mr. Keelyn, is there anything here which you are willing to exhibit to us which will show by the writings made at the time what price was charged for each of the 1,000 telephones it appears from these entries you furnished to the Fort Wayne Company in June 1896?

Mr. BIRNEY: Objected to as utterly immaterial and as being not in response in any way whatever to anything asked in the examination in chief.

A. Telephones furnished at the time were under a general contract, evidently, and I am not certain that I can furnish any particular writing showing a divided price upon the telephones under that agreement at this moment.

Q. That is the same contract, I believe, which you this morning declined to produce for us or attempt to find? A.

I did not understand that I had declined to attempt to find the contract. My impression is that I declined to sub-
1203 mit that contract upon the ground shown in my statement.

Q. Have you yet found the book which is known as "J" referred to in the entries in the account on page 307 of ledger B in entries dated in July, August and October, 1896? A. Not yet.

Q. I believe you stated before we took the recess that you would be able to produce the books referred to as "J" in the account with the Home Telephone and Telegraph Company? A. Yes, sir.

Q. How far back does that book go. What is the date of the earliest entry in it? A. You mean with respect to the account of the Home Telephone and Telegraph Company?

Q. Yes. A. December 15, 1898. It would appear that items as of date November 1, 1898, are entered in this book.

Q. Have you made any effort to find the book referred to as "J" in the account on page 307 of ledger B? A. I have questioned the employes with respect to their ability to find these, and have been informed that with their other work, it will require a search possibly of some considerable extent.

Q. Will you please state whether the entries which appear upon pages 268, 284 and 290 of ledger C, and upon pages 465 of ledger D, like the entries which have already been
1204 put in evidence, are general in their character, referring on the debit side to S. B., and the other side where the payment is not in cash "J?" A. I believe so, if I understand the question correctly.

Q. You find, do you not, that the letter J refers to journal? A. I believe so.

Q. How far back does the only journal which you have produced go? A. December 1, 1898.

Q. On page 465 of ledger D, out of six entries on the credit side, do not two of them refer to J and two to C? A. I believe so.

Q. Have you not looked at it, Mr. Keelyn, and do you not see that it is so? A. Yes; I see two J's and two C's.

Q. Do you not also see that there are only two other entries in that account on that page, on that side of the account, being both "cash." A. There are two cash entries, two J's or journal entries and two C's.

Q. What does C mean? A. I believe it means cash. I am so informed.

Q. The two entries marked "J" on page 465 of ledger D are respectively $25 and $10, are they not? A. $25 and $10 respectively; yes, sir.

1205 Q. Please let us see the journal entry which corresponds with those two entries in Ledger D? A. I furnish

the journal for exhibition, for the purpose of examining these two items, with the same objection that I have heretofore made against detailing for public record the private affairs of this company with its customers.

Witness produces book marked "journal," upon page 12 of which is this entry:

"Home Tel. & Tel. Co.

"25 W. G. A. Trans., R. G. 29 (465)..... 25.00"

By Mr. WORTHINGTON:

Q. What does R. G. 29 mean? A. Returned goods.

Witness also exhibits to counsel for defendant the same book, on page 36, an entry which is as follows, and which accounts the defendant offers in evidence:

"Home Tel. & Tel. Co.

"25 hooks R. G. 36 (465)..... 10.00"

By Mr. WORTHINGTON:

Q. In the entry which I have just offered in evidence, on page 12, what does the 29 mean in R. G. 29? A. Probably the folio of the returned goods book.

Q. Do not the entries of the other accounts with these two companies on the credit side of the ledger which rfers to J relate to goods returned also? A. Probably in a good many
1206 cases. I could not say without examining each one of them whether they all do or not.

Mr. WORTHINGTON: As to the account in these ledgers C and D with the Home Telephone and Telegraph Company of Fort Wayne, as the accounts are quite lengthy, counsel for defendant offer in evidence those on the credit side of the account which refer to J, and they are as follows:

May 25, 1898.....	250.00
July 7, 1898.....	10.00
July 30, 1898.....	8.00
August 1, 1898.....	275.00
August 24, 1898.....	106.80
December 19, 1898.....	266.33
	916.13

By Mr. WORTHINGTON:

Q. Assuming that the entry on page 307 of Ledger B, under date of July 31, 1898, "By J, $3,000.00," refers to goods returned, why were they returned?

Mr. BIRNEY: Objected to for the reason that there is nothing whatever in the testimony to warrant counsel in assuming that the entry refers to goods returned; therefore the hypothetical question has no basis.

A. I am not willing to assume that any item refers to goods returned unless I am familiar with that item. I have already stated that I could not say whether all of the items under the letter J were for returned goods, without specific examination of each item, and, further, for the reason that the item referred to as $3,000.00 in no way is indicated from the books
1207 that it would be for returned goods, and is almost prima facie for some other charge or credit. I will give my belief that the item of $3,000 is for bills receivable. I mention these matters in detail and at length, for the reason that I have been impressed that the counsel have some other motive than to get the information upon which my direct testimony was taken, and to learn particularly why these items were to "J" or to some other letter.

Q. Mr. Duvall has testified to certain complaints that were made by officials of the Interior Department concerning the telephone plant which your company installed in that department. Are those complaints in writing, or any of them? A. If I could know what complaints were referred to I might answer this more intelligently. What complaints, for instance, did Mr. Duvall testify to?

Q. He has testified in general language that he went down there as a representative of this company on several occasions in response to complaints that had been made of that plant. He gave it as his opinion that the trouble arose from the want of proper management on the part of the officers there who had charge of the plant. Since you have stated on your direct examination an excellent opinion entertained of your plant by the customers of the local company in Fort Wayne, and to a certain degree the customers of the company using your system in Newark, New Jersey, I desire the court in Washington
1208 to see what the officials who use it in Washington think of it. Have you on your files letters from the officials of working of that telephone plant which your company installed the Interior Department in Washington complaining of the there?

Mr. BIRNEY: That is objected to for the reason that this witness was not inquired of in any way on direct examination touching the plant in question, and it is not a proper subject for cross-examination.

A. We have some letters from officials of the Interior Department, of a long time past, which might be considered complaints of the system used in the Interior Department in Washington.

Q. How far back is the latest of those letters? A. As near as I can recall, about a year; that is, letters by officials of the Interior Department complaining to us; if we have such letters, and my recollection is that we have some letters which might be considered complaints.

Q. Will you kindly produce them?

(The witness at this point left the room and subsequently returned.)

The WITNESS: An investigation for the purpose of obtaining any letters that might be considered as complainants from the officials of the Interior Department leads me to the belief that such letters as I stated in my previous answer I believed we had received of that nature are open somewhat to doubt. My employes, whom I designated specifically to make the examination of our files and records for the purpose, tell me with-
1209 in a few moments that they were unable to find any letters from officials of the Interior Department complaining of the system there, and it may be that such letters as I first stated might have been received with respect to the complaint of the Interior Department system, may not have been received from officials of the Interior Department and might have come from our representatives or others there. I have a recollection of the fact that we have received some letters complaining of the Interior Department system, but am not certain, as first stated, whether these were from officials in the form of complaints.

Q. I wish you would describe now the operation of the switchboard which you say your company has recently installed in Newark, New Jersey, from the time the calling subscriber goes to the telephone until the communication between the two subscribers is closed? A. When a subscriber in the Newark Telephone Exchange turns the crank of the bell or magneto it sends a current over a line through a coil in the switchboard in the central office, which actuates an armature, an extension of which sustains a shutter, which shutter falls and acts as an indicator to the operator, indicating that the subscriber of that particular number wishes to communicate. The operator places a plug into a jack, which connects with the calling subscriber's line, presses a lever, which connects her telephone instrument with said line, and asks what number, as is usual in telephone practice. When the subscriber gives the operator the number desired, the operator then places a corre-
1210 sponding connecting plug into the jack of the subscriber desired, presses the same lever to a ringing position, which operation sends a current to the bell of the called-for subscriber, indicating that he is wanted. He takes the telephone from the hook, places it to his ear, and thereupon inter-

communication between the first-mentioned calling subscriber and the last-mentioned called-for subscriber is easily accomplished. When the communication is ended, either one of the subscribers communicating may turn the crank, sending an impulse through the line which causes another indicator to be shown to the operator. The operator thereupon returns the plugs to their normal position and the lines are ready, as before the operation recited, for another use or communication.

Q. With how many subscribers is the central exchange of your system in Newark, New Jersey, connected? A. The switchboards of the Newark Telephone Company have connected with them lines which enable the subscribers to reach about 2,000 telephone subscribers within the city of Newark, and about 4,000 or 5,000 telephone subscribers in the interconnected systems by toll lines, interconnecting exchanges outside of Newark.

Q. How many subscribers' lines in Newark lead to the main exchange directly and not to another exchange? A. In the main exchange of the Newark Telephone Company in Newark there are somewhat less than 1,500 subscribers' lines connected, I believe.

Q. How many operators' positions on the board? A.
1211 There are on that board for 1,500 subscribers' lines 15 operators' positions.

Q. Then each operator, I suppose, has 100 subscribers' lines to take care of—I mean calling subscribers. A. On the main board each operator has 100 lines or more to care for.

Q. They average about 100 to each operator? A. About.

Q. Are there any other operators at the same switchboard, and, if so, how many, and what is their business? A. In the same switchboard room there is also a chief operator and a transfer operator. The latter operator is employed in making connections between this main exchange and the other cities connected by toll lines and the other exchanges in Newark, being branches or districts of the Newark system.

Q. Is each of the fifteen operators upon the main part of that switchboard able to connect a calling subscriber with any one of the other 1,500 subscribers without the aid of any other or auxiliary operator? A. No; in ordinary practice each operator does not attempt to connect the calling subscribers whom she has charge of with each and all of the other subscribers in the system. She is enabled to complete the entire connections of calling and answering with 300 or 400, constituting the division of subscribers whose jacks are within her reach. In connecting one of the calling subscribers whom she has particular charge of with a subscriber who may have his jack
1212 located in front of another division, she only does a portion of the work required of her when she both answers

the calling subscriber and connects for him the called-for subscriber; that is to say, when the operator answers a subscriber in her division who may want to communicate with a subscriber in another division of the switchboard, she places one plug, the answering plug, in her subscribers' jack, asks as before related, "what number," and when given the number on the removed division she presses a button, which interconnects her operator's telephone set with the operator's telephone set of the division in which the subscriber called for is located, gives his number, designates the plug line used in answering, and leaves the other part of the work to the other operator, that other part of the work consisting of inserting the corresponding plug at that division into the jack of the subscriber wanted. It will be thus seen that in the one case used as an illustration the operator makes all of the motions, and inserts all of the plugs necessary to interconnect two subscribers, while in the other case one operator inserts the plugs and takes the instruction from the calling subscriber and the other operator inserts the other plug to call the subscriber.

Q. In that case how does the auxiliary operator know what number is wanted by the first operator? A. As stated, the first operator instructs the second operator, repeating
1213 the number of the subscriber called for, which information has been given to her by the subscriber calling.

Q. She does that through her telephone, does she? A. Yes; by the pressure of a button she is able to connect her operator's head telephone and transmitter with the other operator's head telephone and transmitter.

Q. And then those two operators speak to each other precisely as two subscribers would speak to each other? A. As two subscribers would speak to each other.

Q. How many drops are there to each division of that Newark switchboard? A. 100 to each section, but 300 to a division.

Q. Then each operator can reach 300 without the aid of an auxiliary operator? A. Yes.

Q. So, then, if the total number of drops is 1,500, it would be about in four-fifths of the cases that the aid of an auxiliary operator would be required to complete the connection. She could reach 300 and the other 1,200 would have to go through another operator. Is that correct? A. Yes, sir; normally so.

Q. What do you mean by normally so? A. At night, for instance, one operator may operate the entire switchboard.

Q. I am speaking of the ordinary conditions during the day. A. Yes.

1214 Q. How many auxiliary exchanges has the Newark Telephone Company in the city of Newark? A. Three in operation.

Q. How many subscribers to each? A. I think something over 200 in one and something over 100 each in the two others. I am not certain just what number is in each of those. It may be 300 or 400 in the first one mentioned and 200 in the other two. I will say 100 and more in each.

Q. When one of the subscribers who connects directly with one of the auxiliary exchanges desires to communicate with a subscriber in Newark who is connected with one of the other exchanges, what is the process by which they are put into communication, so far as it differs, if at all, from what you have already described, and which it is unnecessary to repeat? A. There is a very slight difference in the operation between the exchanges and that between the operators themselves in the main office. From the auxiliary exchanges to each division operator's position in the main office are lines ending in jack or plugs or both, which the operator in the auxiliary exchange may use for interconnecting purposes between herself and the operator on the main switchboard, much the same as an operator on the main switchboard in one division might intercommunicate with an operator on another division.

Q. Then the operator, for instance, in the main switchboard who gets a call from number ten for number 2,000 (who,
1215 we will say, is connection with another exchange in the city), communicates with the exchange to which No. 2,000 belongs, and through her operator's telephone informs the operator at the other exchange, who listens through her telephone, that number 2,000 is wanted; and then the operator at the second exchange completes the communication with number 2,000. Is that it in substance? A. That is it, other than it seems a long way to go to get to the point in describing the operation.

Q. Assuming, then, that the total number of subscribers to all of the exchanges of the Newark Telephone Company in the city is about 2,100, in six-sevenths of the communications it is necessary that two operators should act instead of one. Is not that right? A. Approximately that might be assumed as correct, to illustrate one phase of the operation of the system.

Q. Is it not exactly correct; if not, why not? In other words, is it not as likely to be an underestimate as an overestimate? A. That would seem reasonably true, so far as the number of operators acting is concerned, but so far as the number of acts of the operator is concerned the relative ratio of operations would be cut down nearly proportionately; that is, if one operator handles both plugs through their entire evolutions, if the evolutions are divided between two operators for the same service, one operator would only do one-half the work of evolutions of the two plugs necessarily involved in all connec-

1216 tions except with the additional pressing of the buttons and repetition of the number of the called-for subscriber, which is only a slight portion of the whole work in the several evolutions required to interconnect two subscribers; and, further, with the qualification that the disconnecting or ending evolutions of the subscribers' intercommunication the signaling work employed reduces the operation ordinarily employed to a minimum, so much so, that it might relatively be said that the operation, in the form of switchboard in use at Newark, of disconnecting subscribers after they have rung off, to use the ordinary term, is less work or involves fewer evolutions of the operators with two operators employed than with one operator, as commonly used in other systems.

Q. You have described what takes place when the same operator receives the call and reaches the called-for subscriber. What is it in that operation that is omitted when that connection is made by two operators instead of one? A. In the operation of our switchboards—

Q. Please confine yourself to the Newark switchboard. That is all I am asking about at present. A. In the operation of the Newark switchboard I have not indicated that anything was omitted when two operators completed a connection instead of one operator.

Q. I understood you to indicate that there was time saved in some way, or that it was more advantageous in some way, to have two subscribers put into communication by two operators than by one. My purpose is to ascertain what it is that

1217 is saved, if anything, or what the advantage is. A. I have in my other answer given reference to switchboard systems in practice as defining the difference in operation over that practice at Newark. There are in the Newark switchboards visual lamp signaling devices which indicate to an operator, or, rather, to both operators, somewhat the character of the connection desired. The boards are equipped with little incandescent lamps, which give out light. These lights are grouped in colors, red, white, green, blue, etc. The colors distinguish the character of connection desired somewhat, and enable the operator to dispense with certain movements that might otherwise be required. For instance—

Q. Will you pardon me for interrupting to say that the question which I asked you was what, if anything, you saved by having a communication between two subscribers effected by two operators instead of one in your Newark switchboard. That is the only question that is pending. A. I should answer that briefly by saying that there is nothing saved in time of operation or number of evolutions, whether one operator handled the connection alone or two; that is, two operators would not reduce the amount of work.

Q. Is it not just this, that when there are two operators one performs part of the operation, then communicates with the other, who performs the rest, and the only difference is that when there are two operators there is the added evolution, as you term it, of the communication between the two
1218 operators? A. In a portion of the Newark board the operation is by tests to determine whether the line is in use or not. By the use of the two operators in making a connection the test is done away with, saving time and more efficiently furnishing the service. To that extent the two operators might be said to save some time or effort or service over the one operator, where the test was employed, and necessarily, in order to determine whether the called-for line was busy, and is not necessary where the two operators make the connection together.

Q. When an operator on that Newark switchboard receives a call for a subscriber who is in her section, how does she learn that the called-for subscriber's line is busy? A. It is apparent to her visually when a line is in use, as the plug in the jack in front of her is plainly in view.

Q. Will you tell me how it is possible when two operators are employed to ascertain the fact that the called-for line is busy in less time than is required under the circumstances you have just indicated? A. As stated before, certain of the lines in such a system and in practice in Newark require what is commonly known as a test or busy test. When one operator, in order to complete a connection with such a line, makes such a test, it requires as much or more time of determination than the simple pressure of a button and instruction to a cor-
1219 responding operator who may have the plug before her eyes for responsive information that the line is in use. This "busy test" is not in use in Newark on all of the switchboard lines, but is in use in some parts of Newark, and I mention it to avoid conflict in my testimony as to how two operators might as readily, if not more readily, complete a connection than one operator. However, the practice in Newark in general connection might be said to employ slightly more time with that system in connecting through two operators in that system than through one operator in that system.

Q. You are now departing from the question again, which is how it is possible for two operators in communication with each other to ascertain that a called-for line is busy in a shorter time than one operator can, when all that operator has to do is to look at the jack of the number called for and see that there is a plug in it. A. My last answer, I believe, will cover your point, Mr. Worthington.

Q. In the case supposed, where two operators are required,

how does the first operator learn that the line of the called-for subscriber is busy? A. By pressing a button, giving the number of the called-for subscriber to the operator before it, who in turn says "busy," or by the action of one of the colored lights hereinbefore referred to, which might instruct her that the line was busy, the system being so arranged that when an operator in one division desiring connection with an
1220 operator in another division or a subscriber in another division selects the line connecting the corresponding plugs a signal light is lighted, which is intended to go out immediately upon taking up the corresponding plug by the operator called for, which, if not accomplished immediately, would lead to the supposition by rule that the line called for was busy.

Q. What proportion of the Newark switchboard is equipped with these colored lamps or lights? A. The entire switchboards of the Newark main office are equipped with colored lights or signal lights.

Q. How many of those lights are there for the 1,500 subscribers who come directly to that exchange? A. I could hardly give the number offhand, but would say that there are something like 100 or maybe 200.

Q. Why is it that in some cases the information to the first operator that the line called for is busy is oral from the auxiliary operator and in other cases visual by the colored lights? A. A matter of preference or expediency with respect to the character of service called for at the moment or of adaptation of rules to the system. Such systems do not always admit of an arbitrary rule. The practice is varied at times, and the rule is somewhat varied upon different kinds of service. In some instances, for instance, it is particularly desirable to know that the subscriber has actually finished talking, not only from the fact that he has signaled or that his indicator which
1221 should record his signal has served its purpose of notifying the central office to the effect that he has finished talking, but to be more clearly certain that the conversation or communication is ended, which may be accompanied by the instruction of the operators, as first mentioned upon this subject between each other. The two operators may actually then connect into the subscribers' lines, and by calling learn whether the subscribers are, or either of them is, still desiring to communicate, which is a particularly important matter in telephone service where tolls are charged or long distance connections may be involved; this latter character of service calling for a different rule of practice than that ordinarily employed in interconnecting local or so-called local subscribers with each other.

Q. You will perceive that you have drifted entirely away

from my question, which is confined to matters relating to that new switchboard of your company in Newark. I have not asked you, and for the present do not intend to ask, any question about the operation of other switchboards, either of your company or of other companies. I ask you again why it is that upon that Newark switchboard the information that the called-for subscriber is busy is sometimes made known to the first operator orally and at other times visually? A. I understand that in the operation of the system at Newark, New Jersey, the question admits of my answering it from a standpoint
1222 of all of its operations, and not what may be practiced particularly one day or another day without my knowledge by the respective operatives there at this moment. I have therefore indicated the opportunities of the system for its practical operation, as I suppose they may have or may employ it. I do not know in which particular instance they may have used at any specific time the lamp signal to indicate when the line was in use or conversation finished or when the operator's circuit was orally utilized.

Q. When two operators are employed to make a connection in that Newark switchboard, what happens when the first operator receives a call for the same subscriber in another part of the board immediately after she has given the first one? How does she ascertain whether or not the first call is finished? A. She knows that she has already a call in use for that subscriber, because if she had previously called for that subscriber, which in the Newark system would have been necessary in line with this question, she would have made this connection and would have known by the usual method whether or not the subscriber had finished talking. It would be apparent to her that the circuit she had used for the previous connection was there in use for that purpose and had not been restored to its normal position.

Q. How would she know it? A. It is before her visually. She could see it. She could carry in her mind, if neces-
1223 sary, that she had connected the subscriber.

Q. I understand she has a plug in the jack of the calling subscriber, and that the plug in the jack of the called subscriber is in another division which is not before her. Is that it? A. That is not, if I understand, directly in line with your previous question; but to qualify it so, I understand that two operators are designated as operator A and operator B. Operator A having subscriber No. 20, has called for a connection with subscriber No. 700 through operator B. Thereafter subscriber No. 24 calls for subscriber No. 700. Operator A would necessarily answer to subscriber No. 24 that B was busy, or it would be apparent visually to her in the connections previously in

use. It would not be difficult for operator A to carry in mind the fact that she had just made an unfinished connection with subscriber 700, and that it was still in use.

Q. My question is addressed to the very point of how it is that operator knows that the first communication is finished. How is she informed of that fact? A. How is she informed that the first is finished?

Q. Yes. A. When subscriber No. 20 or subscriber No. 700, having been connected, finish conversation, a turn of the crank would send a signal to the switchboard, which would expose an indicator, either or both of the ordinary shutter type and an incandescent lamp directly in front of operator A,
1224 which operator would know thereby that a signal from the subscribers had been made, indicating that the conversation was finished. Her first operation thereupon, by rule of practice in Newark, is to remove the plug. Either one of the plugs remaining in position would leave lighted one of the lamps referred to of a color distinguishing the fact, directly in front of the operator responsible, that a specific thing was still undone and must be immediately done. It is the practice in Newark to have a monitor or multiple of these signals in a special board, at which sits a directing operator, which latter operator's duty it is to watch the operation of such lamps or signals, and upon the lighting of such a signal indicating the conclusion of a conversation, if the plugs are not immediately removed, the directing operator would cause the operator responsible to do so at once.

Q. In that case it requires three operators to attend to the operation from beginning to end? A. In that case, where the usual practice was abridged and the operators did not properly do their duty, it might require, as stated, the assistance of a chief operator to compel them to do it.

Q. Suppose that, although the first conversation is finished, both the subscribers hang up their telephones without ringing off or turning the crank, as you call it; how do the operators then learn that the wire is not busy in the operation of that Newark switchboard? A. Either of the operators may
1225 at any time, which is the usual practice in the Newark system as elsewhere, frequently listen in and ask, "Are you done?" "Are you through?" and from the response or absence of response determine whether the conversation or communication has been ended. This is true with respect to certain of the telephones in Newark, and the general practice there. I do not wish my answer to leave the inference that it is necessary in all cases in Newark to turn the crank, for with at least some of the telephones in use in Newark the practice is simply to return the receiver to its hook, which thereby pro-

duces a result notifying the operator at the central office that the conversation is finished.

Q. Are those telephones last referred to by you manufactured by this company? A. Yes.

1226 Q. How long have you been manufacturing them? A. Somewhat similar telephones I think have been made up here in our factory for two or three years past, at times. I wish, at this period, to object to answerinng questions of specific construction and details of apparatus made by us for the purposes of this examination, illustrating the products of this factory and the number of our customers, which I think is a little more than is required for the purposes of my examination.

Q. In Newark, when the called for subscriber is at another exchange in the city, how does the first operator learn that the called for subscriber is busy? A. The operator would press the button of her instruction circuit and inquire of the operator before whom the jack of the called-for subscriber is placed, and receive her response.

Q. And how would the first operator in that case learn when the conversation between the two subscribers was finished. A. When a subscriber at one exchange signalled the central office, either by turning the crank or returning the telephone to the hook, it would operate to release a signal or light an incandescent colored lamp before the respective operators, showing the ending of the communication.

Q. How many of the telephones in the Newark Telephone Company furnished by this company are equipped with the devices to which you have referred by which the hanging up of the receiver alone upon the hook signals the operator

1227 that the conversation is at an end and the turning of the crank is not required? A. I decline to answer that.

Q. Why? A. For the reason that I think it is in the nature of prying into, and the eliciting information of a private nature, unnecessary to determine the matters of my direct examination.

Mr. WORTHINGTON: I insist upon an answer, and I give notice to counsel for the complainants, that if the witness refuses to answer, we shall move to strike out, first, his entire testimony, and in the second place, all that which relates to the telephone systems of which said company has control, and which it has put in operation, and which I understand this witness has proposed and now proposes to introduce into the city of Washington, if he has an opportunity.

By Mr. WORTHINGTON:

Q. I insist upon an answer, Mr. Keelyn.

A. I could not give the exact number, if I were to answer it, because as indicated, to begin with, I am not certain. I believe there are only a few of the telephones equipped with automatic hooks. A great many of the subscribers there believe that the automatic hook is a nuisance because they do not know when they have called the central office, or that it has rung off, as they call it. And the practice there has therefore demanded mostly all of that type of telephone
1228 which employs the crank to ring the bell. The exact number of each I cannot tell, as I do not know.

Q. You have said you think there are a few. What do you mean by a few? Less than ten or less than 100? A. I believe they are only employed in a few instances. Maybe it might be less than ten.

Q. Describe the mechanism of your telephones, so far as it would show how it is that the hanging up of the receiver signals the central office that the conversation is at an end?

Mr. BIRNEY: Objected to as immaterial.

A. I want to say that in this examination I protest against the line of questioning as being made for the purpose of laying the foundation for information to be used in other cases than the case in suit for which testimony is now being taken; I do not want to appear unwilling to furnish such testimony as may illustrate the ordinary operation of the Newark system, or such systems as we are furnishing; but I do protest against what appears clearly to my mind and belief as an effort to lay a foundation for a species of intimidating lawsuits by the Bell monopoly, and its representatives, following that which our relations to them in history indicates might be done. I wish to say that it is not any discourtesy to the attorneys, but it is positively my belief that the purpose of the experts usually employed by the Bell Company to
1229 furnish evidence, present at this meeting, and the promptings of these experts to the counsel for the defendant impress me with the belief that this is the purpose of the line of questioning now being resorted to.

Mr. WORTHINGTON: I will state for the information of the witness that the questions that I have asked in reference to these automatic telephones at Newark have arisen in my mind during the examination of the witness in the last few minutes, and are not the result of any conference or communication with anybody, even with my associate counsel here, and that I asked them in the interest solely of the Chesapeake and Potomac Telephone Company, which Judge Wilson and I

represent here, because I thought when they were asked and still think, that it is exceedingly important in this particular case, concerning which this testimony is being taken. I remind the witness that it is not in our interest that he was put upon the stand and testified in a general way as to the efficiency of the telephonic apparatus which this company furnishes, which general testimony requires me in detail, to such extent as counsel may think sufficient, to ascertain what the specific facts are, to pursue the examination—the general purpose of cross-examination anywhere and I might say that since the witness has intimated what had not occurred to me, that his company may be infringing patents, controlled by some other company, it is exceedingly important for the court to know when considering whether a telephone exchange can be carried on at such figures, whether in addition to the ordinary expenses, the company in carrying
1230 on that business will be liable to large expenses of litigation, and in the next place, possible heavy decrees or judgments in the way of damages.

Mr. BIRNEY: Counsel for complainants objects here and protests against the committing to paper of Mr. Worthington's argument and speech.

Mr. WORTHINGTON: I have stated it for the information of the witness, and I now insist upon an answer to the question.

Q. Please describe specifically and minutely the construction and operation of those automatic telephones in Newark, N. J., so far as they relate to the matter of the transmission to the central office of a signal informing that office that the conversation is over from the mere hanging up of the receiver on the hook?

Mr. BIRNEY: I object to the question as immaterial and irrelevant.

A. An ordinary portable telephone with a hook attachment, similar in general appearance to that which is in use on a desk, consisting of a stand on which said hook is mounted, together with a transmitter, mouthpiece, etc., wires laid to the stand from the battery to operate the transmitter; and wires also laid to the stand from the switchboards, wires from a generator circuit also laid to this stand; the hook or re-
1231 ceiver holder operates in pressing springs or releasing the pressure from the springs, so that contacts are made or broken and thereby connections made or broken between the generator circuit mentioned or the subscribers' lines, or the battery wires. I am unable to describe at this moment specifically how these springs are arranged in relation to each other and have tried to be as lucid as possible in the brief answer returned.

Q. Those telephones then have a battery of their own? A. Yes, sir.

Q. In the main exchange at Newark, referring of course to the Newark Telephone Company, how close together do the operators sit? A. It depends upon the time of day, or the amount of business to be transacted at the time.

Q. I speak of the busiest time of day? A. I think the respective distance between the center of the operators, if I might so describe it, would be about 26 or 27 inches. That is, each operator is allowed a space of something less than 30 inches in which to sit, move, etc., other than that space which she may reach into in placing a plug in another board.

Q. Then the distance from one end of the line of operators to the other end is about how much? A. For how many operators?

Q. For the fifteen that I understood you to say are employed at that switchboard when it is in full operation. A. About 35 feet from end to end of switchboard.

Q. How long has that switchboard been in opera-
1232 tion? A. I don't remember the date at which it was started, but several months.

Q. Has this company since then set up a telephonic exchange in any city, having over, say, 1,000 subscribers? A. Not complete.

Q. I think you said that that Newark switchboard was designed here by your company or by your engineers? A. Yes, sir.

Q. Does it then represent the most improved switchboard which this company manufactures for use in larger towns? A. No, sir; not today.

Q. What improvements have you made in those few months? I am speaking of switchboards for large towns. A. We are continually improving switchboards. It might fairly be said that no one switchboard put out did not contain some improvement upon any previous one. The nature of switchboard designing or superintending is to improve, and particularly so with large systems, such as a thousand or more subscribers require.

Q. Did the Newark switchboard of which we have been speaking take the place of an old switchboard, or was it a new exchange? A. The Newark switchboard replaced another form of switchboard.

Q. Made by whom? A. I am not certain, but I believe it was made by a concern in Baltimore, Maryland, I think they called it a Best switchboard.

Q. What are the principal improvements in switch-
1233 boards which your company has made since the Newark switchboard was installed a few months ago? A.

A great many. They are of such a nature that I hope the counsel will not bristle my hair by asking me to give that private information.

Q. I will not unless they have been put into use somewhere. If they have, I would like to know it? A. Not in general practice.

Q. Then they are matters within the office here which have not been made public? A. Yes, sir. I should say that they are still matters within our office.

Q. Have they been tested and in actual use anywhere? A. I believe we have made some things that have been put to test that we expect to embody in large switchboards if necessity calls upon us for building them hereafter. I mean by necessity, the demands of our business, our customers. I might say that we have experienced somewhat and figured upon multiple jack systems upon which the patents expire, I think, this month.

Q. Then you are inclined to think that the multiple jack system covered by the patent that has just expired is an improvement upon what you have been doing. Is that so? A. I have maintained in my testimony, and have continually said, when a like question was asked me by our customers, that

1234 I considered the multiple jack system of less practical efficiency for telephone service than that in use, for instance, in the switchboard in Newark, New Jersey, furnished by us; that certain features of the multiple jack switchboard might be utilized to advantage, but the multiple jack system as generally known, I believe, must give way to that divided central office system of which I have heretofore testified. No one switchboard can be comprehended as efficiently capable of doing all of the service in one central office, involved in the intercommunication of the United States; and since it is impracticable to put all of these lines into one central office, it will continue to be impracticable to bring all of the lines of the future telephone system, such as may be anticipated reasonably in Newark, N. J., or Washington, D. C., into one central office by any known multiple jack switching system, with as good results as that which would obtain upon the subdivided multiple transfer system on the lines of those employed in Newark, N. J.

JAMES E. KEELYN,
By the Examiner, by consent.

At this point a recess was taken until 7:45 o'clock P. M., at Room 6, Auditorium Hotel, Chicago.

1235 Room 6, Auditorium Hotel,

Chicago, Illinois, January 17th, 1899, 7:45 p. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney.
Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.
Present, also, Mr. Isaiah W. Farnham.

FRANCIS WILLIAM DUNBAR, a witness of lawful age, called by and on behalf of the complainants, having been first duly sworn, is examined.

By Mr. BIRNEY:

Q. What is your age, residence and occupation? A. Francis William Dunbar; age, 30; residence, Highland Park, Illinois; occupation, electrical engineer.

Q. You have said you are an electrical engineer. Please state where you received your education as such? A. I am a graduate of the Massachusetts Institute of Technology, in the course of electrical engineering, class of 1890. For three years after graduating from the Massachusetts Institute of Technology I was the assistant engineer of the American Telephone and Telegraph Company, commonly known as the Long Distance Telephone Company, and while occupying this position I had occasion to familiarize myself, and did familiarize myself, with the principal telephone systems which were in use and
1236 operated by the various lessees of the American Bell Telephone Company, and had occasion to design and inspect telephone systems and telephone exchanges as well as outside equipments; that is, the underground and overhead systems of wires and also the subscribers' station apparatus.

Q. After you left the employ of that company, The American Telephone and Telegraph Company what then became your occupation and where were you engaged? A. For several years after leaving the American Telephone and Telegraph Company I was employed by various telephone and telegraph companies as an expert in the design of telephone and telegraph instruments, circuits and line construction. During the last year and a half I have been nearly constantly employed as the electrical engineer of the Kellogg Switchboard and Supply Company, of Chicago, and while acting in this capacity have designed and installed a telephone switchboard and exchange and subscriber's apparatus for the Kinlock Telephone Company, of St. Louis; said switchboard having a present equipment of something over 6,000 lines, and at present I am engaged

in installing a telephone switchboard and subscriber's apparatus, in Indianapolis, Indiana, for the New Telephone Company, of said place, acting as engineer for the Kellogg Switchboard and Supply Company.

Q. During the period you have just related, to what extent were you called upon to make estimates of cost of constructing telephone plants, relating to the outside construction as
1237 well as the interior equipment? A. While I was with the American Telephone and Telegraph Company I was called upon to design and install such telephone exchange systems and trunking apparatus, and necessarily became familiar with the different systems which were used by the lessees of the American Bell Telephone Company. Since then I have devoted a great deal of my time and attention to the cost of installation of telephone exchanges, as well as the cost of operation and maintenance of telephone exchanges, and have made detailed estimates for telephone exchanges in several of the large and several of the small cities in this country.

Q. Have you, at my request, examined the testimony of the witnesses, August P. Crenshaw and Joseph Edward Crandall, touching the plant of the Chesapeake and Potomac Telephone Company, of Washington, D. C., and particularly the defendant's Exhibits "L" and "M," found in their testimony on pages 487, 488, 502 and 503? A. I have done so.

Q. Please state if in your examination of Exhibit "L," being the statement given by Mr. Crenshaw of the outside construction work of that plant, you found any disproportion in the capacity of conduit and cable to the capacity of a 2,200 drop switchboard; if so, what disproportion? A. I found in the Exhibit "L" referred to that there was approximately 132 duct miles of underground system, which is far in excess of the duct mileage required for 2,200 subscribers' stations in Washington, D. C. In fact, allowing even on the average but 70 twisted pair conductors per duct, the ducts would serve over
1238 9,000 subscribers' stations. And if a greater average number of metallic circuits per duct were assumed, such as would be secured by the use of cables averaging 100 pairs of conductors per cable, the capacity would be sufficient for over 13,000 subscribers, assuming in both cases that the average length of each subscriber's metallic circuit was one mile, which I consider excessive for Washington.

Q. Are you familiar with the city of Washington? A. I have visited the city of Washington, and know in general the lay of the land; but in examining defendant's Exhibit L carefully I have been able to get a very concise idea of the underground system which is required for Washington, as such exhibit is detailed very thoroughly.

Q. Have you examined the items of Exhibit "L" with reference to determining whether the prices thereof as fixed by Mr. Crenshaw are fair? If so, with what result? A. I have examined Exhibit "L" with this object in view, and with the exception of certain perhaps minor items of estimate, I would consider the estimate, in so far as it relates to the cost of the apparatus enumerated, as very fair, and, in fact, what I think a careful engineer would estimate upon, allowing always a certain percentage to insure falling within the actual cost if such apparatus were installed, and necessarily allowing for the quite general variation in prices of such apparatus as is considered.

Q. Have you also examined Exhibit "M," found in Mr. Crandall's testimony, at pages 502 and 503, already referred
1239 to for the same purpose? A. I have done so, and with the exception of the estimates on the cost of subscribers' station equipment, both metallic circuit and grounded circuit, I would pass the same criticism or approval as in my previous answer. In reference to these two items, I consider the estimate is quite excessive.

Q. What, in your opinion, taking your knowledge of prices and your experience in such matters, is a fair price to be allowed for the cost of installing complete a subscriber's station with metallic circuit, the equipment being of the long distance telephone type of the ordinary wall pattern? A. I would consider that about $16 per subscriber's outfit would be an outside figure, and a careful estimate for the cost of the installation of subscriber's telephone sets, consisting of the ordinary long distance type of telephone, placed upon the ordinary wall set, the above figure including not only the cost of the subscriber's apparatus, but also wiring of said apparatus as far as its junction with the outside system and including the cost of the battery to operate the said telephone; that is, two or three cells of acid battery.

Q. What, in your opinion, would be a fair price to allow for the installation of a grounded circuit equipment in a subscriber's station? A. As the grounded circuit apparatus varies greatly in design and efficiency of operation, I would have to assume numerous ground circuit types of subscriber's instruments in order to make a true comparison between the
1240 cost of installing such subscriber's grounded apparatus with the metallic circuit apparatus which I have previously considered; but I would state in general that if the best type of subscriber's instruments is employed it would make a very slight difference only whether the subscriber's apparatus were wired for a metallic circuit or for a grounded circuit, as in both cases it is customary to take two wires from the subscriber's apparatus, running both to the outside line circuit, if

it be grounded, running one of them to the outside circuits and one of them to the ground.

Q. Have you, at my request, made an estimate of the cost of a telephone plant to be established in the city of Washington, having a capacity for serving 2,200 subscribers, the plant to be underground in the business part of the city, or substantially as in the existing system, and overhead as in the existing system? A. I have done so.

Q. Please state what was the result, and what you consider to be a fair price for such a plant? A. I have assumed, as requested, an actual equipment of 2,200 subscriber's stations, all of such stations being metallic circuit stations, and each of the circuits serving but one subscriber; that is, excluding entirely party lines. I have also assumed a subway or duct equipment for a capacity of approximately 3,000 metallic circuit lines and a cable equipment of approximately 2,500 subscribers' lines. I will give below a brief summary of the esti-

1241 mates as outlined above:

SUBSCRIBERS STATION EQUIPMENT.

	First Cost.	Annual Expense.
2200 subscribers' sets, complete, all metallic long distance transmitters, wall set, two cells acid battery, installed and wired up to outside system, at $16. per set	$35,200.	
Maintenance and depreciation, at $5., per set		$11,000.
2200 subscribers' terminals, wired complete from cable heads or house top terminals to beginning of inside work	$8,800.	
Maintenance and depreciation of above at 10 per cent per year		$880.
	$44,000.	$11,880.

CENTRAL OFFICE EQUIPMENT.

	Equipment.	Yearly Cost.
Switchboard complete for 2200 lines wired and connected to completed power board, distributing board, &c.	$34,000.	
Maintenance and depreciation at 10 per cent per annum.		$3,400.
Cost of cable terminals (heads) and connections to distributing board	$4,000.	
Maintenance and depreciation of above at 5 per cent per annum		$200.
Yearly expense, salaries of operators, chief operator, switchboard men, &c		$11,000.
Rental, power, light, heat, &c		$6,000.
	$38,000.	$20 600.

1242

OUTSIDE EQUIPMENT.

	Cost of Construction.	Annual Expense.
Cost of cables for 2500 subscribers' metallic circuits, laid, spliced, and tested	$42,450.	
Maintenance and depreciation, at 4½ per cent per annum.		$1,910.
Cost of ducts for approximately 3000 subscribers' lines entering the exchange, and for approximately 2000 miles metallic circuit capacity of outside ducts capable of serving approximately 3000 subscribers	$25,000.	
Maintenance and depreciation at 3 per cent per annum		$750.
Cost of overhead and aerial construction for 2200 subscribers' metallic circuit lines, including necessary poles and copper wire, including the stringing of the wires, setting of the poles, and also the aerial cable, when advantageous to so use	$41,000.	
Maintenance and depreciation, per annum		$6,000.
Cost of the manholes, junction boxes, house top terminals, drop boxes, etc	$15,000.	
Maintenance and depreciation		$450.
	$123,450.	$9,110.

1243

SUMMARY.

	Cost of Installation.	Yearly Expense.
Subscribers' station equipment for 2200 lines	$44,000.	$11,880.
Outside equipment, comprising an equipment of 2500 cable lines and 3000 line duct equipment	$123,450.	$9,110.
Central office equipment for 2200 lines	$38,000.	$20,600.
	$205,450.	$41,590.
General expenses not included in the above figures of maintenance and depreciation, and including salaries of executive officers, clerks, advertising, auditing, printing, engineering staff, &c., per annum		$17,000.
Total yearly expenses		$58,590.

or approximately $26.50 per subscriber per annum.

In the above estimate, while I have given a practically 40 per cent additional capacity for subscribers' lines in the duct system and an approximately 15 per cent additional equipment in the cable installation over the actual equipment of subscribers' lines, these additional capacities are far less than in the Exhibit "L." Also, I have excluded in the above estimate the cost of installation of public stations, private switchboards and other private installation, and also the cost of equipment and maintenance of the toll lines from the Washington exchange. In other words, the estimate is practically
1244 for a 2,200 line exchange, with an additional capacity for future growth, such as would naturally be allowed in an engineering estimate. Also, at this point, I wish to state in reference to the subscriber's station equipment, spoken of in my previous answer, that I understand in Washington, as well

as in other cities in this country, a certain percentage, although it may be small, of the subscribers are equipped with more elaborate cabinet work than the ordinary wall set which I have taken as a basis in my estimate.

Q. Are you able to give the cost of installing what are known as public stations? A. Only in a general way. For instance, in most of the large cities I think the majority of the public pay stations are placed in apothecary's or drug stores, and frequently in cigar stores, at a very slight cost of installation, scarcely exceeding the cost of installation in a subscriber's station, while in other cases quite elaborate cabinet work, including sound-proof booths, are installed, which installations are considerably more expensive than the subscriber's installation, and I might remark also, in general, considerably more remunerative than the subscriber's station.

Q. Will you please define what you mean by toll lines, Mr. Dunbar? A. A toll line is a line distinct from a subscriber's circuit, and is used to connect two subscribers in different exchanges and between exchanges where a toll charge is
1245 made for such connection. In other words, a toll line is, generally speaking, a trunk line, as distinct from a subscriber's circuit over which a charge is made for giving service between subscribers. I will state at this point that in speaking of the toll lines in my estimate running out from the Washington exchange I also included, although not in words, trunk lines going from the Washington exchange over which toll charges may not be exacted, if there be such lines.

Q. That is, as I understand you, your estimate excluded such lines as well as the toll lines which you expressly excluded? A. Yes; I might state that in those words. In other words, my estimate excludes all trunk lines going out from or entering the Washington exchange, whether toll be exacted over such lines or not.

Q. Please explain what you mean by such trunk lines? What is the use of such lines as those of which you speak? A. In almost all of the large cities, although I believe it is not so in Washington, there are two or more and, in general, several exchanges, to which such subscribers' lines are focused; that is, certain subscribers' lines are brought into one exchange and other subscribers' lines are brought into another exchange, when a subscriber at one exchange wishes to communicate with a subscriber in another exchange.

Q. You mean the trunking system between exchanges? A. Yes; between two exchanges.

1246 In determining the figures of your estimate, what plan have you pursued as to over-statement or understatement? A. In all of the figures, I have given what I con-

sider to be the outside figure in both cost of construction and yearly expense. In other words, I consider that the estimate is excessive in cost of construction and maintenance, rather than the reverse, although I have attempted to give the figures as closely as possible in all cases.

Q. In your estimate, what type of switchboard of 2,200 capacity have you included? A. I have assumed a switchboard practically identical in style of construction and method of operation as that which I understand is now in use in Washington, and which is commonly known as the bridging or branch terminal multiple switchboard.

Q. You have given the total annual cost of maintaining and operating such a system as that you have described at $26, and a fraction per single telephone. What, in your opinion, would be the increase or decrease of cost per telephone, for a similar system of 4,000 subscribers? A. There would be certain factors in the estimate which, both in cost of construction and yearly expense, would be increased per subscriber by the increase in the number of lines from 2,200 to 4,000, such, for instance, as the cost of installation of the switchboard and the maintenance and depreciation of the same. There are other items, such as the cost of installation, and also the yearly maintenance and depreciation of the cable equipment and duct equipment, which would be decreased per subscriber. There are other factors such as the maintenance and depreciation of the subscribers' station apparatus, which would not be materially affected one way or the other. I believe that the total yearly expense per subscriber would not be materially altered either one way or the other by the increase in the number of subscribers from 2,200 lines to 4,000 lines, with the system assumed in my estimate.

1247

Q. Have you made any estimate or calculation, Mr. Dunbar, of the total cost of construction of a 4,000 capacity plant? A. I have not done so in detail in reference to the installation at Washington, D. C., but have based my calculations on other estimates which I have made in similar cases.

Q. What is your estimate, if you can give it to us? A. The cost of construction per subscriber, as well as the yearly cost of maintenance, depreciation and operation, which I have taken up in my previous answer, would not be materially increased in either direction in the system which I have assumed in my estimate, although, as I have previously mentioned, one factor, that is, the cost of installation of a central office equipment would be quite materially increased per subscriber.

Q. Have you had occasion to investigate and consider the question whether an increase of subscribers in a given ex-

change, after the business district of the city has been supplied, brings with it an increased number of calls per subscriber, and if so, what investigation have you made,
1248 and with what results? A. I have considered this question very carefully and have made a careful study and investigation to satisfy myself and to find out whether we should expect an increase or decrease in the number of calls per subscriber per day as the number of subscribers increase in a certain exchange, and particularly as the question asked me assumes after the business portion or busy portion of a city or exchange district has been supplied with telephone service. I am convinced that with high rates or high charges for telephone service, in which case the principal increase of subscribers comes from the business district, an increase in the number of calls per day per subscriber naturally results especially if the service be good. When, however, either by reduced rates or other causes a great number of subscribers is obtained from the residence districts of our large cities, which telephones are used on the average a far fewer number of times per day than are the telephones in the business district, and are also used at a different period of the day than are telephones in the business district, then the average number of calls per day per subscriber will not materially increase, and in fact, I consider that it will not increase at all, over the number of calls per day per subscriber when the fewer number of telephones are served, the majority from the business districts.

Q. Is it your experience that the small dealers in a city use the telephone as freely as large dealers?

1249 Mr. WORTHINGTON: I must object to this, because I do not think that it appears that Mr. Dunbar is qualified to testify as an expert on that subject.

A. I find that the small dealers do not use their telephones on an average as many times per day as the large dealers. This statement would naturally exclude such telephone stations as apothecaries where the practice of the public in a great many cities, is to drop in and use it at their convenience.

Q. Mr. Dunbar, do you know how many manufacturers of telephone switchboards there are in the United States? A. I do not know the total number, but in Chicago there are fully half a dozen such houses. In the East there are two or three with which I am acquainted, and in the West several more; but I do not consider that I know all or nearly all of such houses which are fitted to supply and which are supplying telephone switchboards.

Q. Can you give a statement of some of the larger cities of the country in which a single system of telephones is in use; that is to say, one company is operating where the trunking system between exchanges is in use? A. Yes; in Boston, in New York, in Brooklyn, in Buffalo, in Chicago, in St. Louis; and in fact it is the exceptional city of any magnitude in this country in which I can remember all of the subscribers of the Bell system being connected with one central station. It is the rule with the lessee companies of the American Bell Telephone Companies to provide branch exchanges in con-
1250 nection with the larger or main station, and not the exception.

Further taking of these depositions was thereupon adjourned until Wednesday morning, January 18th, 1899, at 9:30 o'clock A. M., at the same place.

1251 Room 6, Auditorium Hotel, Chicago, Illinois,

January 18th, 1899, 9:30 o'clock A. M.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney.
Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

Cross-examination of Francis William Dunbar.

By Mr. WORTHINGTON:

Q. At what time in the year 1890 did you graduate? A. The last of May.

Q. When did you enter the employment of the long distance company? A. About the 1st or 10th of June, 1890. I think it was about the 10th of June.

Q. You left the service of that company at what time in 1893? A. I think it was June 15th, 1893.

Q. And during that entire period of about three years you held the position of assistant electrical engineer? A. Yes, sir: with the exception of, I think, a period of five to six months when I was the acting engineer, so appointed by the general manager during the engineer's absence on account of serious sickness.

Q. Who was the engineer? A. Mr. Frank A. Pickernell.

Q. While serving as assistant electrical engineer or
1252 acting engineer, where were you stationed? Where was your main office? A. In New York City a portion of the time, at 18 Cortlandt street, and a portion of the time at the engineering office on Cedar street.

Q. The name sufficiently explains, but perhaps you had better tell us on the record what is the business of the long distance telephone company, or what was the business of the long distance telephone company while you were connected with it? A. The long distance telephone company might be described as a company organized to connect together the various lessee telephone companies of the American Bell Telephone Company by means of so-called long distance telephone circuits which were to provide and which do provide means for connecting a subscriber in any certain exchange in a particular city with another subscriber in an exchange in another city, said subscribers being connected to the long distance line after first passing through the local exchanges in the several cities. The long distance telephone company also does an extensive business—

Q. Please confine your answer to what it did when you were connected with it. A. It did an extensive business in the private line telegraph, connecting by private wires various bankers and broker houses in the several cities, without passing through the local telephone exchange. While with the long distance telephone company, as I have previously stated,
1253 it became a portion of my duties—

Q. You will perceive, Mr. Dunbar, that you are now departing from my question, which was to tell me the business of the long distance telephone company while you were connected with it. A. But I was also going to explain as a portion of my business another portion of theirs.

Q. Very well. A. (Continuing) To inspect the telephone systems used by the various lessee companies, to study such systems, and to recommend apparatus and changes in circuits and systems, and also to devise circuits and telephone systems as well as telephone apparatus with the object of bringing into greater harmony the telephone apparatus that was used by the various lessee companies of the American Bell Telephone Company.

Q. The long distance company did not operate any of the local exchanges, did it? A. The long distance company did not operate any of the local exchanges, although the company was provided with telephone switchboards in a great number of the eastern and central cities, and it became necessary to establish connections between the local exchanges and the long distance system in practically the same manner that connections are handled in the local exchanges. This was usually accomplished by trunking circuits, and trunking devices connecting the local telephone exchange with the long dis-
1254 tance switchboard. It was through this intimacy and similarity in the establishment of connections that I

necessarily became very familiar with the apparatus used by the local companies, and made a special study of the telephone apparatus used by the various local companies.

Q. What was the largest of the telephone switchboards with which the long distance company was provided, referred to in the first sentence of your answer to my last question? A. The one at Cortlandt street, New York City.

Q. How large was that? A. There were, to the best of my recollection, about four or five hundred standard sections of switchboards when I first came with the American Telephone and Telegraph Company, and as I remember about eight or ten at the date I left the said company. There were perhaps one hundred and fifty long distance toll lines entering these boards, and in the neighborhood of 25 to 50 private or local telephone lines used principally by the officers of the company.

Q. What was the next largest of these switchboards operated by the long distance company while you were with it? A. I think the one in Boston was the next largest.

Q. How large was that? A. It at that time, I should judge, had about half the number of lines of the board in New York City. The bulk of the long distance business, at the time I came with the long distance company, was between New York and Boston, and intermediate points, and between New York and Philadelphia.

1255 Q. When you made inspections of the various local exchanges and made your reports of the result of your inspection, to whom were the reports made? A. Almost always to my immediate superior, Mr. Pickernell, and in general they were reported in the shape of conferences or discussions over the various systems that were in use.

Q. I was about to ask you whether any of them were in writing? A. I will answer that also. As a general rule, they were discussions. More I would not be able to answer positively.

Q. Do I understand that during your connection with the long distance company you inspected all of the local exchanges with which it was connected? A. I did not inspect all of the local exchanges which were then in connection with the long distance lines. I did, however, inspect the exchanges in most of the larger cities, and also those exchanges in which there were particular problems to be taken up in reference to the long distance service.

Q. Please name the six largest of the local exchanges which you inspected in this way? A. Cortlandt street, New York, Boston, Philadelphia, Detroit and Brooklyn, were probably the largest of the exchanges which I inspected personally.

Q. I asked you to name the six largest. You have given us but five. A. Aside from these I remember inspecting

1256 the Providence exchange, the several exchanges in Connecticut, several exchanges on the Philadelphia line, several exchanges in central Pennsylvania, the majority of which last telephone exchanges were small, but in which there were some particular problems to be taken up.

Q. I again ask you to tell us which was the other of the six largest local exchanges that you inspected? A. I mentioned that it might be in Providence, but at present I cannot recollect absolutely which were the six largest exchanges; but I have mentioned those which I remember inspecting, and have mentioned those which may be the six largest which I inspected.

Q. When you were connected with the long distance company did it have any connection with the exchange in Washington, D. C.? A. I have never inspected the Washington exchange, and I do not recollect at this time whether when I first came with the long distance people Washington was connected with New York City. It certainly was before I left the long distance company.

Q. Were you in Washington between June, 1890, and July, 1893? A. I do not remember having been in Washington between those dates.

Q. When were you first in Washington after July, 1893? A. It was some time during the World's Fair and shortly after I recovered from an illness, but the exact date I do not
1257 remember.

Q. Have you been employed by any telephone company since you left the long distance company in July, 1893? If so, state in chronological order the companies with which you were connected, the position which you held, and the duration of the service. A. For a period of six months or a year I was in the employ of the Clamond Telephone Company, of Philadelphia, as their electrical engineer, on a per diem basis. Also I was similarly connected for a period—

Q. Before you leave that, please state what that per diem was—what you mean by a per diem basis. A. You mean in figures?

Q. Yes. A. If I remember right, it was either $10 or $15 a day and expenses; and for a period of about six months, I think I gave them fully five, and I do not know but six, days a week of my time. I was similarly employed, and, as usual, on a per diem basis, by the Kiernan News Agency, of New York City, and by a printing telegraph company which was then introducing the Page Printer, which was being operated by the Kiernan News Agency. In this case the problem was to place the printing telegraph circuits in the telephone cables of the Metropolitan Telephone and Telegraph Company in lower New York City.

Q. You have not stated what your per diem basis was with that company. A. I think with that company my per diem was $25 a day and expenses.

1258 Q. How many days were you employed? A. I was retained by the above company for a period of a year or fourteen months, but it was only during the first six or eight weeks, or perhaps three months, that I gave them any great proportion of my time; I should judge on the average three or four days a week. I have acted as a consulting engineer—

By Mr. BIRNEY:

Q. The question calls for a chronological statement. A. That would be difficult unless I should sit down and examine my old papers. I have acted as consulting engineer for other telephone companies and for individuals interested in the telephone business almost exclusively in opposition to the telephone companies operated by the American Bell Telephone Company, and I have given evidence on the witness stand in quite a number of infringement and interference cases. I have given a great deal of my time during the last few years to Mr. Kellogg's work in the telephone business, always on a per diem basis; but, as I have previously stated, I cannot give in any chronological order the various periods at which I have been employed by the above mentioned parties and companies. I have already stated that during the last year and a half I have been employed nearly all of my time on Mr. Kellogg's work in connection with the Kellogg Switchboard and Supply Company.

Q. When did you first go into the employment of the Kiernan News Agency and the company in New York? A. I
1259 think it was a few months before I went to the Clamond Telephone Company in Philadelphia, and if that is so, it would be about September or perhaps October of 1893.

Q. Then did you leave those companies and go to the Clamond Company? A. If I am right, I went with the Clamond Telephone Company with the understanding with the Kiernan News Agency that if they desired my presence at any time I would immediately give them my services, and a similar condition existed with the Clamond Telephone Company. I am quite positive that a portion of the time I was retained by both companies spoken of, with their mutual consent and mutual understanding.

Q. Did the Clamond company, while you were connected with it, operate any telephone exchanges? A. No, s.r.

Q. What was its business? A. Private installation of instruments for hotel service, factory service, house service, and use on shipboard, and various other such uses.

Q. Did the systems which they introduced require electrical connections for their instruments or were they in the nature of speaking tubes? A. They were Morton telephones, electrically connected, and capable of being used not only for the purposes enumerated, but also for exchange work; although, as I previously stated, the Clamond Telephone Company themselves avoided going into the telephone exchange business.

1260 Q. What, if anything, did you have to do with the telephone exchange business when you were working for the Kiernan News Agency and the Printing Company of New York? A. At the time I was called by the Kiernan News Agency they were having a vast amount of trouble, caused by the induction which their circuits produced on the telephone circuits in the Metropolitan system of cables in lower New York City. I think at that time the Metropolitan Telephone and Telegraph Company had already notified the Kiernan News Agency that they must remove their circuits from the telephone cables, such a notification clause haveing been introduced into the contract between the Kiernan News Agency and the Metropolitan Telephone and Telegraph Company at the time the Kiernan News Agency secured the rental of the wires in the telephone cables belonging to the above telephone company. I was requested to remove, if possible, the disturbances caused by these printing telegraph circuits, which circuits were carrying two or three or four-tenths, and in a number of cases, as I remember, five or six-tenths of an ampère at 110 volts, alternated thirty or forty times a second. The problem was one in which not only a study of the cable system was required, but also a study and knowledge of the switchboard and exchange apparatus.

Q. Who is Mr. Kellogg, to whom you have referred? A. Milo G. Kellogg, of Chicago, Illinois, who is now the
1261 president of the Kellogg Switchboard and Supply Company.

Q. Have you been in the employ of Mr. Kellogg or of the company of which he is president? A. For a number of months, at least. After the Kellogg Switchboard and Supply Company went into business I was in the employ of Mr. Kellogg personally, and since that date I am not sure what arrangements Mr. Kellogg has made with the company.

Q. What have been your duties in the employ of Mr. Kellogg or his company? A. I have acted as a telephone engineer, and have designed the apparatus for the telephone switchboard and subscriber's apparatus; have supervised the manufacture of said apparatus in the factory, and have supervised the installation of the switchboard which the Kellogg Switchboard and

Supply Company installed in St. Louis for the Kinlock Telephone Company. I am at present doing similar work in reference to a switchboard to be installed in Indianapolis.

Q. Aside from St. Louis and Indianapolis, what is the largest switchboard that has been designed and put into actual operation by Mr. Kellogg or his company during your connection with it? A. As far as I know, and I think my knowledge is absolute, no other switchboards have been manufactured or installed by the Kellogg Switchboard and Supply Company except those mentioned in the question.

Q. The one at Indianapolis is prospective entirely, is
1262 it not? A. Yes; it has not been installed.

Q. Then the only switchboard which it has actually installed is the one at St. Louis? A. Yes; that is so.

Q. When was that installed? A. The installation was begun about June of last year, and is at present practically completed and ready to be turned over to the Kinlock Telephone Company.

Q. That board is to accommodate how many subscribers? A. The equipment of the above-mentioned board is at present 6,160 lines, with an ultimate capacity for about 20,000. I may mention also that we are about to begin work on the extension for the above exchange, increasing its equipment to practically 9,000 lines.

Q. Has it yet been used in actual operations to connect subscribers' stations; if so, how many subscribers' stations have been connected with it? A. To the best of my knowledge there are something over 4,000 subscribers which have been connected with the switchboard, and they are making connections between this number of subscribers daily.

Q. How long has it been in actual use for the purposes of a telephone exchange? A. The service was begun gradually and, I believe, about two months ago, beginning necessarily with a small number of subscribers and gradually increasing the number.

1263 Q. Please describe that St. Louis switchboard.

Mr. BIRNEY: Objected to as utterly immaterial to the examination in chief, not responsive to it in any way, and not called for by it.

A. The switchboard may be described briefly and accurately as follows: It is divided into four divisions, in each division being located a calling enunciator for each subscriber in the whole exchange. Thus each subscriber may at will, by means of four buttons placed on his instrument, and by the use of the customary magneto generator, signal at will to either one of the four divisions of the exchange and secure the attention of

the operator, who can then connect him directly and without passing through any other operator, with the desired or called-for party. The subscribers are indexed in four divisions or groups, the groups in St. Louis being designated as A, B, C and D, in substantially the same manner as in other cities, Chicago, for instance, where the subscribers are indexed under Main, Harrison, Express, West, North, Drexel, Oakland, and so forth and so on.

Q. Does each of the four buttons on a subscriber's station sound the signal over the same wire? A. It is so arranged that by positive and negative pulsations, secured by pressing the different buttons, pulsations of opposite polarity may at will be sent over either side of the metallic circuit. All of the circuits used in St. Louis are metallic circuits, and with
1264 an auxiliary ground connection used for signaling. Thus one side of the circuit is used for operating two of the enunciators at the central office, the said circuit being to ground and the other two enunciators are operated by currents of opposite polarity, passed over the other side of the circuit, with a return metallic circuit, utilizing the first-mentioned side of the line.

Q. How does the subscriber know which button to push? A. In the same way that in the systems ordinarily in use the subscriber finds that he desires connection with a party located in Main 243, for instance; that is, in Chicago. Similarly, in the system referred to in St. Louis, the subscriber finds that the party desired is indexed as A 243, and consequently knows that he is to push the A button while turning the generator, in order to get into communication directly with the operator who can give him the desired connection.

Q. Is this four-button arrangement something new in telephone exchanges? A. It is.

Q. How many subscribers' lines reach each of the four divisions of the St. Louis board at present? A. Provision is made so that on each division of the board one-quarter of the total number of subscribers—that is, with the present equipment, 1,540—may be reached directly by any operator at that division for outgoing calls. For incoming calls, as I have already stated, incoming call spring jacks and drops or enuncia-
1265 tors are located at each of the four divisions of the switchboard for each of the subscribers in the exchange.

Q. How many operators' positions are there to each division of the board? A. Three, with provision for using but two of the operators if the business so demands it.

Q. Did I understand on your direct examination that you were the inventor of this new board? A. Oh, no.

Q. Who is? A. Mr. Kellogg.

Q. Then if that board has an ultimate capacity of 20,000 when it is working to its full capacity, each set of three operators would to have take care of nearly five thousand subscribers? A. No. I see where I have probably misled you in my last answer. The four divisions to which I have referred are each composed of several sections, and in the case of St. Louis seven sections. Each of these seven sections has three operators' positions.

Q. Will you please state what practical experience you have had in the operation of any telephone exchange? A. My first experience was in Canton, Massachusetts, where for a period of two or three weeks I operated the switchboard controlled by the New England Telephone Company, and acted also as their local manager. I took this position as an accommodation to
1266 the regular local manager, who was extremely anxious to make a quick exchange in his business. The exchange was a small exchange.

Q. You may as well state how many subscribers there were. A. Handling less, I think, than 100 lines, and possibly no more than 75.

Q. There was one operator, then, I suppose? A. One operator only was required. Since then I have never been employed as an operator, but I have taken pains not only while I was with the American Telephone and Telegraph Company, but since—

Q. You will perceive my question was addressed to your practical experience, as distinguished from your theoretical knowledge. A. That is just what I am answering—(continuing previous answer)—to sit down and in both busy and idle portions of the day handle the connections at an operator's position, becoming an operator for the time being. I, of course, did this to study accurately the different factors in the switchboard which I was investigating.

Q. What practical experience have you had in constructing telephone plants and systems aside from what you have told us about assisting the Kinlock Company and assisting Mr. Kellogg and his company in building a switchboard at St. Louis? A. One of the first installations that I made was the trunking installation; that is the installation which connects the entire
1267 long distance telephone system of New York City with the then Metropolitan Telephone and Telegraph Company. This system I devised, supervised the construction of the apparatus at the Western Electric Company, and personally installed in 1892, I believe. I also designed and supervised the construction of the apparatus for the telephone exchange system in Buffalo, which went into the residence district, I believe, and which was practically ready for installation

at the time I resigned my position with the American Telephone and Telegraph Company in 1893. I had also, before leaving the Telephone Company, laid out a nearly similar apparatus to be installed in Boston. In both of these latter cases I may state that where I have spoken of designing the apparatus, I refer to the apparatus and not to the system, which system is, I believe, covered by a patent taken out by Mr. E. J. Hall and Mr. Pickernell, I believe. I had occasion while with the Long Distance Telephone Company, aside from these exchange and trunking apparatus which I have mentioned, to devise systems, circuits and apparatus for various telephone systems which we were then working upon with the idea of getting something that might be better or cheaper than the multiple switchboard.

Q. Was the work of which you have been speaking in Boston and Buffalo done as a part of the work for the local exchange there or for the Long Distance Company? A. The Buffalo installation was for local work as a branch exchange of the Bell Telephone Company in Buffalo, while that for Boston, if I remember aright, was designed either to connect the long distance system with the New England Telephone and Tele-
1268 graph Company or to be used in connection with the Long Distance Telephone Company's lines.

Q. Who employed you to do that work at Buffalo? A. As I have stated, I did not install the apparatus in Buffalo, as the installation was not made until after I had severed my connection with the American Telephone and Telegraph Company; but in the design and construction of the apparatus I was employed as usual by the American Telephone and Telegraph Company, and I do not know what arranagements were made with the local company in Buffalo in reference to the cost of designing or the cost of installing this apparatus.

Q. To return for a moment to the St. Louis switchboard: I now understand that that is divided into four divisions, that each division is divided into seven sections, and that each section has three operators' positions. Is that right? A. That is right.

Q. And that the ultimate capacity of the board is 20,000 subscribers? A. That is also right.

Q. Will you tell me how many subscribers that will give to each operator when the board is working to its full capacity of 20,000? A. That would give about 220 to each three operators' position. I will state that increasing the equipment of the switchboard will not alter the number of subscribers' lines handled at each three operators' positions, 220, as I have stated, because as the number of subscribers connected with the switchboard is increased, not only will each section of

1269 the switchboard receive additional equipment, but additional sections of switchboard must also be supplied, to allow facilities for operation for the additional operators which will be required for the increased number of subscribers.

Q. Then when the board is working to its full capacity of 20,000 how many operators' positions will it have? A. The ultimate capacity of the board, to be exact, is for 20,240 lines. When the switchboard is equipped with the full 20,240 lines there would be 92 sections of switchboard each with three operators' positions.

Q. Does that include any provision for trunking to other exchanges or offices? A. It does not. The idea of the exchange in St. Louis is to bring all of the subscribers' lines into the main switchboard. We have also installed what we designate a toll line switchboard, at which the different trunk lines, whether they be toll or trunk lines without toll charges, will terminate. By means of this additional switchboard the local subscribers may be connected with the toll or trunk lines.

Q. While I think of it, are there any patents upon this St. Louis switchboard? A. There are.

Q. How many? A. I am unable to state; but the fundamental or broad patents were taken out by Mr. Kellogg in the early part of the nineties, I believe, and there are certain other features which he has also covered by patents.

1270 Q. Do you not know he has over 100 patents connected with that switchboard and appurtenant apparatus? A. Is that question on the record?

Q. Certainly it is. A. I know that he has recently taken out about 125 patents at one time relating to telephone apparatus, and that he also had previously taken out a number of patents on telephone apparatus; but I do not think that all of these patents relate to the apparatus which has been installed in St. Louis.

Q. Is the board which is to be installed in Indianapolis to be in all respects similar to the one which has been just installed in St. Louis? A. It is similar in all respects to the board which has been installed in St. Louis. It is designed for a two division exchange instead of a four division exchange. That is, each subscriber will ultimately be enabled to call into two divisions only of the exchange, and will be provided with but two buttons on his apparatus.

Q. In other respects it is substantially similar to the St. Louis board? A. In other respects, it is substantially similar, although certain changes in the details of the apparatus, that is, in the mechanical details, have been made.

Q. With a view to an improvement over the St. Louis board? A. With a view to an improvement over the St. Louis board.

Q. What does your knowledge and experience of
1271 these matters teach you as to whether changes and improvements of various kinds in switchboards have been going on in the last few years and are still going on? A. Ever since my entrance in the telephone business in 1890, there have been numerous radical changes made in telephone apparatus; not only the apparatus used by the lessees of the American Bell Telephone Company, but by other companies. Previous to 1890 I understand and in fact know from observation, that even more radical changes and improvements have been made in the apparatus used by the American Bell Telephone Company's lessees.

Q. Are not the changes and improvements which are made from time to time invariably covered by patents? A. It is not always possible to cover such improvements and changes by patents; and in a great many cases such changes and improvements have not been covered by patents. In a great many other cases they have been.

Q. What is the general rule? A. I think the general rule has been with the American Bell Telephone Company, and with the Western Electric Company and with the lessees of the American Bell Telephone Company, to patent everything possible to secure a patent on, in connection with telephone apparatus.

Q. Can you tell me of any material improvements that has been made by anybody else in the last five years, say, which have not been the subject of a patent? A. I know of a great many cases of improvement in the mechanical design of apparatus upon which I do not consider a patent would be granted.

I think in general, however, that where a change of
1272 design or an improvement, either in construction, or a system is capable of receiving a patent grant from the United States, that the inventor usually applies for such a patent.

Q. What practical experience have you had in the matter of the expense attending the running of a telephone exchange in cities, of, say, over 150,000 inhabitants? A. While with the American Telephone and Telegraph Company, it was not necessary for me, nor in fact was it required of me, to make any reports, as I remember, on the cost of operation of exchange systems except in a very generaal way. Realizing this very early in my employment by the American Telephone and Telegraph Company, I took pains to study the question, with especial reference to the cost of operation and the cost of maintaining telephone apparatus, both inside and outside. I made the most of my opportunities at that time, and the question is one that I have studied continually and studied deeply

ever since I entered the telephone business. I have made numerous calculations and numerous estimates, and have talked the matter over with people who have been in charge of the operating and maintenance departments, of telephone companies both in the employ of the lessee companies of the American Bell Telephone Company and of independent telephone companies. One of the principal points which must be considered in laying out a telephone exchange, is the number of connections which can be handled at one operator's position, for upon this factor depends the size, construction and cost of the telephone switchboard. I have also
1273 studied carefully the cost of maintaining outside apparatus as well as the depreciation of the outside apparatus, both while with the American Telephone and Telegraph Company and since. I may state that while with the American Telephone and Telegraph Company, the operating department called upon me very frequently in emergency work to repair their telephone lines which were down, in all of the eastern portions of the country. In doing this work I became very thoroughly acquainted with the materials both of the line construction and the underground construction and the aerial cable construction, and the cost and durability, and consequently the cost of maintenance of such apparatus. I have exchanged views and discussed with numerous engineers and manufacturers as to different points which have occurred to me in reference to the cost of maintenance and the cost of construction and the cost of depreciation of telephone apparatus.

Q. Will you permit me to remind you that you have not answered my question, which I repeat.

The question was repeated as follows:

Q. What practical experience have you had in the matter of the expense attending the running of a telephone exchange in cities of, say, over 150,000 inhabitants? A. If the question means if I have had experience as superintendent of maintenance or superintendent of operation, or if I have had direct charge of the operating and maintaining of a telephone plant in a city of 150,000 or more, I will state that I have not had such experience, but I consider that the experience which I have had, has been far more general and has been far
1274 more valuable to me, and far more valuable in making estimates upon telephone construction, maintenance and depreciation, than if I had been tied down and actually in charge of maintaining a telephone exchange in a city of the size mentioned.

Q. What practical experience have you had in the operation of any telephone exchange except the one which you ran

for a week at Canton, Mass? A. As I have previously stated, my experience has been wholly from an engineering standpoint, and I have never, except in the case mentioned of a small plant in Massachusetts, had immediate charge of either the operation or maintaining of a telephone exchange system.

Q. Have you ever been in Washington on telephone business? A. I do not remember to have ever been in Washington on telephone business.

Q. What is the area of Washington City? A. I am unaware of the number of square miles in Washington, D. C., and have simply a general idea of the arrangement of the city itself, and a knowledge that has been secured by a study of the details of the system, given in the record, which I have read, and the exhibits to which I have referred in my direct examination.

Q. What is the area of the District of Columbia? A. I do not know.

Q. What proportion of the area of the District of Columbia is covered by the city of Washington? A. My impression has been that Washington embraced practically all of the District of Columbia, but I am not positive.

1275 Q. Does the telephone exchange system in Washington, which is referred to in the estimates made by Messrs. Crenshaw and Crandall, to which you have referred in your direct examination, cover the city of Washington only, or the entire District? A. It includes the subscribers which are brought into the one exchange in Washington. Whether or not those subscribers may all be in the city limits, or in the limits of the District, I do not know; but the records show that these estimates are for Washington and not for the entire area operated by the Chesapeake and Potomac Telephone Company.

Q. Do you understand those estimates to include the whole of the District of Columbia? A. As I said, my understanding is simply that it includes those subscribers that are brought into this one exchange in Washington; and as I do not know definitely the limits of the District of Columbia with reference to Washington, I do not know whether any subscriber that is brought into the Washington exchange may be located outside of Washington, or located outside of the District.

Q. If you do not know where the subscribers are located how are you able to locate their distance from the exchange? A. Simply from a study of the exhibits and the testimony given, and also from my general knowledge of Washington itself.

Q. When did you first see this testimony and the exhibits referred to? A. I saw a portion of the testimony and

1276 read it, some week or ten days ago; but yesterday was the first time that I studied the matter carefully and thoroughly.

Q. What part of the testimony was it that you saw before yesterday?

(The witness here produces and exhibits to counsel as the evidence which he saw prior to yesterday, certain pages extracted from the printed report of testimony taken before the Committee of the House of Representatives referred to in the agreed statement of facts which has been filed in this case, relating to the investigation in Congress, these printed pages including among other things the tables introduced in connection with the testimony of the witness Haskins.

It is agreed by counsel for the respective parties that the papers so produced by the witness do not include any statements or exhibits in reference to the cost of reproducing the plant in Washington.)

By Mr. WORTHINGTON:

Q. What was it in connection with the evidence or exhibits in this case that you saw for the first time? A. It was a bound volume containing a copy of all the testimony taken on behalf of the defendant in this case, and of all the exhibits which are copied into the record.

Q. At what hour yesterday was that volume of testimony and exhibits first seen by you? A. About 10 a. m.

1277 Q. How many hours did you devote to the examination of that volume, and to the preparation of your computation as to the cost of reproducing a plant in Washington? A. From 10 a. m. until about 7:30 p. m., with the exception of intervals for my lunch and dinner.

Q. How many hours after deducting those intervals? A. I should say 7½ hours.

Q. Where was this examination of the testimony made? A. The examination of the testimony was made in the offices of the Western Telephone Construction Company, and then I studied the notes and abstracts which I had made from the testimony from about 5 p. m. until about half past seven.

Q. Then it was during those two hours and a half that you made your estimates? A. That I completed it.

Q. What time did you leave the office of the Western Telephone Construction Company? A. I believe it was about five p. m.

Q. In making the estimate which you have detailed in your examination in chief, what allowance do you make for the payment of salaries and wages? Please state the officers and employees for whom you provided, the compensation of each, the

number of subordinates of each class and the compensation of each person of each class. A. Beginning with subscribers' station maintenance and depreciation, I allowed for six to seven inspectors and battery men, at from $1.50 to $2.00 a day, and also about two line inspectors for inside work.

Q. At the same wages? A. Yes; and for work between the junction boxes and subscribers' instruments at about
1278 the same wages, acting also as assistants to the inspectors. Second, in the Central Office equipment, I allowed for one switchboard man and assistant, at a combined salary of about $1,200 a year.

Q. Will you please specify how much you allow for the switchboard man and how much for his assistant? A. About $2.75, we will say, for the switchboard man, and for his assistant the remainder, or about $375 a year.

Q. Before you proceed, will you tell me now, once for all, whether in fixing wages on a per diem basis, you include every day in the year, or only six days in the week? A. Only as many days in the week as they work. One man was a wire chief, or acting as a wire chief, at a salary of about $1,200 a year, or say $1,000 a year.

Q. I perceive there that you vary from $1,200 to $1,000, and that in every answer you have given so far you seem to be figuring about the result. Did you not do that before you gave your estimate? A. I did do so, and each result which I have secured is a result of such calculation; but as I have given a brief of the total cost under three different headings, and have not all of the original figures on which I made the estimates, I would not be able to give the detail of the salaries in exactly the same manner as I have abstracted here on the estimate. Then for the salaries of the operators I would allow for about 33 operators at an average of $300 per year. Also, under the figures for rental, power, light, heat, etc., I have included whatever attendance might be necessary in taking
1279 charge of the small power plant required.

Q. How much do you allow for that? A. Such a man as that would be also busy in maintaining other apparatus in connection with the switchboard and the distributing board and the terminal room, and might or might not be included in the assistant given to the switchboard man or might be handled by the switchboard man himself. The distribution of labor in a telephone exchange installation would be largely determined by the superintendent of operation or the exchange manager; and in my estimate for the inside cost of operation I have given figures which are sufficient to cover the salaries and wages of not only the operators, but also of the other attendants and assistants that might be required in the operation of the switchboard and its appurtenances.

In the outside equipment I have allowed for about four outside men at about $1.75 a day, and for a foreman at about $1,000 a year salary.

In the summary and under general expenses, including salaries of executive officers, clerks, advertising, auditing, printing, engineering, etc., I have made a lump sum of about $17,000, which, from the method in which I have made the summary, is left as an open figure, or as a figure which may be altered either one way or the other, depending wholly upon the organization of the company, whether it handles business in other districts or not; that is, whether it is the only exchange which is to be operated and the only business which is to be handled. That is, whether or not the toll service, public
1280 service, private installation, etc., are to be included or not. If they are to be included, the $17,000 allowed would perhaps be increased, and if such business was not to be included it might be somewhat decreased. The organization of the company would determine largely the distribution of the work which I have included in the general summary; and certain portions of the work might or might not be done by the same department, such as that put down under advertising, auditing, printing, clerks, etc. As I have stated, I think the $17,000 allowed in this estimate is sufficient to cover such general expenses, although, of course, it does not take into consideration legal expenses or any great amount of legal expense; in the same way as the estimate as a whole does not take into consideration the complete destruction of the inside apparatus by fire and the loss due to the business by such cause; nor does it assume that the overhead construction would be entirely destroyed by cyclones or extreme sleet storms, such as have occasionally, in certain parts of the country, caused considerable destruction of property. But I may say in this connection that if the outside work is put up in a strong and substantial manner, such as is contemplated in the estimate, there will be very slight danger of excessive maintenance and depreciation, and that in the central office, if the proper protecting devices are installed, as the estimate allows for, and also if the proper protecting devices are placed on the outside of the cable system, as the estimate also provides for, then the danger from fire and complete demoralization of the central office will be
1281 greatly eliminated.

Q. You will perceive that you are again departing, and very widely, from the pending question. I asked you to enumerate the officials and employees that would be required to run an exchange of 2,200 subscribers in Washington, and to state the compensation which you allowed each person, where there is but one of a class, and to each of a class where

there are several in a class, and the number in each class. You had proceeded part of the way in that direction when this digression occurred. I will ask you to resume and complete the statement. A. I have shown in detail what employees and their wages and salaries I have allowed for up to the point of general expenses, which expenses I stated I have put in at the sum of $17,000. As this sum of $17,000 is one that will vary widely in its distribution, according to the particular organization of the exchange, and as it includes items which are not constant from year to year, it would be impossible for me to sub-divide this item in the same manner that it is possible to sub-divide the other items.

Q. What in your judgment would be the proper salary for the president of a telephone company running an exchange of 2,200 subscribers in the city of Washington? A. That, as I have stated in a general way before, would depend wholly upon whether that exchange was a portion of a larger system, whether it was a unit in itself, or whether other business, such as toll business, trunking business, private line installation and public station service, was to be also rendered by the same system. I should consider that many competent men could be obtained for not over $2,500 a year, to take charge of
1282 the telephone installation of the magnitude referred to in Washington; that is, simply 2,200 subscribers. If, however, we assume that the exchange is to grow and do other business, $2,500 would be a small compensation for the proper head of such a business.

Q. Assuming that the question relates to an exchange of 2,200 subscribers in the city of Washington alone, without any reference to the toll system, or anything else, except the business of the 2,200 subscribers and what was necessary to connect them with the long distance exchange when they wished to be so connected, what office force would you allow the president of the company to assist him in the general work of the management of the company? A. That would depend very largely upon whether the president of the company was also a telephone engineer and whether he himself could devote his time and attention to the business of the company. It would depend largely, also, upon what system of records the company desired to keep, aside, of course, from the pure financial transactions of the company. I should consider that if no extraordinary records were to be kept, a force of about five clerks, at a total of about $3,000 a year, would be ample to conduct all of the executive business connected with the exchange, and that perhaps $2,000 more would cover the audit-

ing and such other general expenses; also that the engineering department could be properly filled for not over $2,000 a year.

The further taking of these depositions was thereupon adjourned until 2:30 o'clock p. m. of the same date, at the same place.

1283 Auditorium Hotel, Chicago, Illinois,

Wednesday, January 18th, 1899, 2:50 o'clock p. m.

Cross-examination of FRANCIS W. DUNBAR resumed.

By Mr. WORTHINGTON:

Q. Are you able to tell us what the item of salaries and wages, including in this item all compensation paid for services of every character, has amounted to in any large exchange in this country, except Washington, during the last six years? A. In reference to the exchanges operated by the American Bell Telephone Company or the American Bell Telephone Company's lessees, I have no means of knowing their exact annual expenditures, except in so far as I have gotten general ideas from various reports; but I have taken close interest in the cost of operation and maintenance and depreciation of several of the exchanges operated by independent telephone companies, and have a very accurate, though general, knowledge of the cost of operation and of the cost of maintenance and depreciation of such exchanges.

Q. At this point I feel obliged to call your attention to the fact that you are again widely departing from the question, which is simply whether you know what any telephone company having a large exchange in this country has spent during the last six years for the single item of salaries and wages. A.

1284 Necessarily, in the cost of maintenance and in the cost of depreciation and in the cost of operation, I have the same general knowledge of the salaries and wages paid to the various employes, and I also have secured general information in reference to the salaries and wages paid in the general expenses of certain independent telephone companies. I will also state that I have made a careful study of the wages and salaries paid to the employes in the main exchange of the St. Louis Bell Telephone Exchange Company.

Q. I repeat the question: Are you able to tell us what the item of salaries and wages, including in this item all compensation paid for services of every character, has amounted to in any large exchange in this country, except Washington, during the last six years? A. To answer the question any more definitely than I have done above, would evidently be impossible, for

I could not retain in my mind the figures showing the exact cost for a period of six years, even if it was possible to secure the exact data from any telephone company, showing all such expenses in a detailed account.

Q. Are you able to give us such figures approximately as to any large telephone exchange in any city where the exchange is connected with two thousand or more subscribers? A. I would not be able offhand to closely approximate and give in detail the various salaries and wages and other annual costs for any particular telephone company operating two thousand lines or over; but I could, by referring to various notes and estimates and calculations, which I have made at one time or an-
1285 other, and which have been based upon the actual cost of operating and maintaining such exchanges as spoken of, give a much more detailed statement of the yearly expenses than I have given in the estimate submitted in reference to Washington. I have based this estimate for Washington upon what I know to be—

Mr. WORTHINGTON: I object to this part of the answer as irresponsive to the question.

A. —the result which would be obtained in such an exchange installed in the manner estimated upon, such knowledge coming from numerous sources of information and a great deal of study which I have made in reference to exactly those points estimated upon.

Q. I do not ask you for details and my question does not relate to any annual expenditures, except salaries and wages. I do not ask for estimates. What I do ask is whether you can tell us approximately the gross amount paid for salaries and wages by any telephone company in the United States in the operation of any telephone exchange in the United States of the size described during the last six years? A. I couldn't give such figures offhand, and in reference to distinguishing between salaries and wages and the maintenance and depreciation, as the two are so closely connected from an engineering standpoint, I do not know that in any of the companies it has been necessary for me to draw a strong and distinctive line between salaries and wages and maintenance and depreciation.

Q. Can you give me the information sought for any one of the past six years as to any other company? A. I
1286 couldn't give it for any one of the six years offhand.

Q. Can you tell us approximately the gross amount paid for maintenance by any such company during the past six years? A. As I have stated, the maintenance and depreciation in the figures which I have collected, and upon which my estimates were based, are so closely connected with the sal-

aries and wages that I could not offhand separate the maintenance from the salaries and wages and give exact figures, any more than I could give the exact salaries and wages and separate them from maintenance.

Q. Please observe again that I do not ask for exact figures, but, as my question shows, only for approximate amounts.

Here the question was repeated as follows:

"Q. Can you tell us approximately the gross amount paid for maintenance by any such company during the past six years?"

A. I could give you offhand the approximate figures for the actual maintenance of the different portions of telephone apparatus in different companies during certain periods of the last six years, as, for instance, in the Metropolitan Telephone and Telegraph Company about six years ago, it was costing a little over four dollars a year for maintaining each subscriber's telephone apparatus, and with three cells of acid battery—

Mr. WORTHINGTON: I object to this answer as not responsive to the question.

A. In reference to the maintenance of the St. Louis
1287 Bell Main Exchange switchboard, I could also state that the maintenance has been, for the past year, about two per cent of the cost of the board. And I could state also that in various companies the maintenance of their underground system has varied from about two per cent to three per cent or upward, depending upon the conditions in the various localities.

Q. Are you speaking of the entire plant of these companies or central office or what? A. I was speaking in the third case of the underground system.

Q. Please state what companies you refer to as you go along. A. The Bell Telephone Company of St. Louis, the exchange operated by the local opposition company in Detroit, and from figures which I have received from other engineers and from cable manufacturers. If required I could secure certain information and very closely approximate the exact information requested in the question; but offhand I am not able to give any more specific response to the question except that the figures which I have taken as a basis of the estimate which I have introduced are based upon actual figures which I have acquired in reference to telephone plants that have been installed, both by the lessees of the American Bell Telephone Company and by opposition telephone companies.

Mr. WORTHINGTON: I object to the whole of this answer, except that portion which refers to the St. Louis Bell Company and the Detroit opposition company, on the ground that
1288 it is not responsive to the question.

By Mr. WORTHINGTON:

Q. You have referred to two companies by name, one that you call the Bell Company in St. Louis— A. Yes.

Q. As to that you say: "In reference to the maintenance of the St. Louis Bell Main Exchange switchboard I could also state that the maintenance has been for the past year about two per cent of the cost of the board." Do you mean by this to confine your answer to the switchboard? A. I do.

Q. My question relates to the maintenance of the entire exchange system. Can you give me approximately any figures as to the St. Louis Bell Company in that respect? A. As I have already stated, I have attempted to select certain figures which I could call to mind of the principal different portions of telephone exchange apparatus and answer your question as specifically as possible. I have stated that offhand I could not give a more detailed or more specific answer to the above question.

Q. How long a period is covered by your answer that the board of the St. Louis Bell Company has been maintained at an expense of two per cent? A. I think it is slightly less than one year.

Q. Where did you get that information and when? A. It was communicated to me by parties in St. Louis.

Q. When? A. About a month or six weeks ago.

1289 Q. Who are they? A. Mr. Dean, at present in the employ of the Kellogg Switchboard and Supply Company, formerly in the employ of the Bell Telephone Company of St. Louis.

Q. Is that all the information you have as to the cost of maintenance of the St. Louis Bell Company? A. That is all the information that I could give offhand—all the figures that I remember accurately.

Q. If you have any further knowledge on the subject let us know what it is, referring to what you call the Bell Company in St. Louis? A. I have not exact figures that I could give offhand in reference to the St. Louis Exchange operated by the St. Louis Bell Telephone Company.

Q. Just what did Mr. Dean say to you about the cost of maintenance of the St. Louis switchboard of the Bell Company? A. We had a long discussion in reference to the method of operation of the new exchange equipment which had been introduced by the Bell Telephone Company of St. Louis, and we discussed it in all its features in reference to the cost of maintenance and operation, and of course depreciation, particularly in reference to the number of lamps which were burned out per day and per subscriber, and also particularly in reference to the cost of establishing each connection in the exchange. This being one

of the newer types of switchboards which the Western Electric Company have manufactured, I took considerable interest in the switchboard and studied it carefully—

1290 Q. You certainly must remember that I asked you what Mr. Dean said to you about the cost of maintaining that St. Louis switchboard, nothing else? A. During our conversation and discussion of the above problems, Mr. Dean imparted to me a great deal of information on the subject spoken of above, but to be more specific in reference to the actual figures would be impossible until I have consulted notes or memoranda concerning the same.

Q. Where are those notes and memoranda? A. Probably at the Kellogg Switchboard and Supply Company's offices in Highland Park.

Q. Did Mr. Dean tell you that the switchboard of the Bell Company in St. Louis had been maintained at an expense of two per cent per annum? A. In reference to your question I have been attempting, at your request, to separate maintenance from wages and salaries, and attempting to eliminate in reference to the figures concerning this switchboard, the wages, which, in my mind, also make up the general expenses of maintenance. As I have stated before the maintenance and the wages concerned in the maintenance are so closely allied that it is practically impossible for me, off-hand, to separate such figures. As I remember it, the two per cent. referred to the actual expense of renewing apparatus, principally lamps, etc., of which there was an unusually heavy breakage during the first few months of the operation of the exchange.

1291 Q. When was that switchboard installed in the St. Louis Bell Company's office? A. Approximately a year ago. I do not remember the date within several months.

Q. From your answer to the next preceding question it is evident that you have misunderstood me. I have first attempted to get from you the figures approximately as to the item of salaries and wages. You said among other things you could not give that, because your information related to maintenance as a whole, as I understood you. I thereupon undertook to get from you, approximately, the figures as to maintenance as a whole, including salaries or wages or whatever you deemed to be covered by that item; and I now again ask you, approximately, for any figures of any telephone company in the United States of the kind described. I do not ask you to separate one thing from another, but to tell us what the total cost of what you call maintenance is in any one of these companies for any year, the last six years, stating it approximately, or coming as near to it as you can? A. To be of any value

I should prefer to take time to make a careful study and examine records, notes, etc., before answering such a question. It would be practically impossible, unless I happened to retain in my mind such a gross figure, to approximate it, except by spending time in examining records, notes, etc.

Q. Did you examine any such notes or records before you made the estimate yesterday which last evening you gave in reference to the cost of establishing and maintaining
1292 a plant in Washington? A. In reference to the cost of operating and maintaining a plant in Washington, which I estimated upon yesterday, such information I have accurately in notes which represent the average maintenance and depreciation, allowing, as I have stated I did, a fair margin for such tlephone exchange system. I had before me, of course——

Mr. WORTHINGTON: I object to this answer as not responsive to my question.

A. I had before me, of course, the figures in the two cities, and the testimony of the two experts to which I have referred (meaning Mr. Crenshaw and Mr. Crandall). In giving an estimate such as I did yesterday, I have absolute knowledge from experience; but when it comes to selecting any individual exchange and giving, off-hand, the cost of maintenance of that particular exchange for the period of six years, or for any year of the six years, it would be impossible without the figures before me.

Q. Take the company you have designated as what you call the opposition company in Detroit. Does that mean the Detroit Telephone Company, of which Mr. Holmes is president? A. Yes, sir.

Q. What do you know about the expenses of maintenance of that company's exchange in Detroit? A. In reference to the sub-way system, including cables and conduits, the figures of which I took pains to secure with the closest approximation possible some six or eight months ago——

Q. From whom? A. Principally Mr. Wiley, of the
1293 Standard Underground Cable Company.

Q. What is Mr. Wiley's business? A. He is superintendent or manager of the Standard Underground Cable Company.

Q. Is it the business of that company to lay conduits? A. It is not. They draw the cables into conduits.

Q. What is the business of the company A. The business of the Standard Underground Cable Company is the manufacture of cables and the laying of the cables, splicing, connecting in and testing out. Mr. Wiley has also made a personal study of the maintenance of these cables in the various places in which they have been introduced.

Q. So far as you know does Mr. Wiley, or does the company to which he belongs, actually keep in repair telephone exchange systems or any portion thereof? A. To the best of my knowledge, the Standard Underground Cable Company does not.

Q. Where is that Mr. Wiley? Where is his company located, and where does he live? A. The Standard Underground Cable Company has its factory in Pittsburg. Mr. Wiley is the head of the Chicago business house, and I think probably is in the city at present.

Q. Have there been any improvements in late years in the instruments and apparatus used in telephone exchanges aside from the switchboard? A. The various operating telephone companies of the American Bell Telephone Company
1294 system have, in the last few years, quite generally introduced, especially in some of the larger cities, a new design of subscribers' station apparatus which I would consider an improvement over the older forms. They have also introduced improvements in the cable and duct equipment during the past eight or ten years, and have also, during the same period, developed and improved upon the transmitters and receivers used at the subscribers' stations. They have also improved upon the method of protecting subscribers' apparatus and Central office apparatus during the period mentioned. These are the principal improvements that I remember or call to mind.

Q. Have there been no improvements made by those who were not connected with the Bell Companies as you call them? A. The Independent Telephone Companies have introduced quite a number of subscribers' station apparatus of various types and designs, some of which I should consider as improvements from what was known eight or ten years ago; and they have also introduced protecting apparatus and other devices which I would consider as improvements, but in no cases, either with the independent telephone companies or with the telephone compaanies associated with the American Bell Telephone Company, would I consider that there had been any extreme innovation in the telephone apparatus outside of the central office equipment during the last eight or ten years, except perhaps, in the more general use of the metallic circuits in the cables.

Q. Are the changes which you have referred to as
1295 improvements, by whomsoever made, as a rule patented? A. Most of the improvements and changes which have been made, both in the underground system, in the protecting devices, and in the subscribers' apparatus, I would consider as unpatentable, and I do not think that pat-

ents have been applied for for them. There are other detailed devices and also certain systems of telephone operation intimately connected with certain of the subscribers' station apparatus which I believe have been patented.

Q. In the estimate which you have made of the expenses of constructing and operating an exchange in Washington, have you allowed anything for royalties or other compensation to the owners of patents, either in the switchboard or in the subscribers' station apparatus or any of the connecting part of the plant? A. In my estimate which I have given for Washington, I have not allowed any such royalties or other compensation, because all of the apparatus estimated upon can be introduced and installed without the payment of such royalties or other compensation. In fact, there are a number of telephone companies which put in the complete exchange system installation such as I have estimated upon for Washington.

Q. Then you do not propose to give us any of the improvements which are now covered by patents, either in the exchange or outside of it? A. My estimate was based upon the best apparatus, and apparatus which would give the best of service to subscribers in Washington.

Q. I call your attention to the fact that you have not
1296 answered the question. A. Please repeat the question.

Q. The question was repeated as follows: "In the estimate which you have made of the expenses of constructing and operating an exchange in Washington, have you allowed anything for royalties or other compensation to the owners of patents, either in the switchboard or in the subscribers' station apparatus or any of the connecting part of the plant? A. If your question implies if I have made allowance for the rental of the transmitter or receiver, or both, to the American Bell Telephone Company, or the royalty on the multiple switchboard to the Western Electric Company, I have not made such allowance. These are the only royalties or fixed compensation of which I am aware in reference to either the inside or the outside apparatus such as is used at present in Washington, D. C.

Q. Mr. Dunbar, it seems to me you have manifested sufficient intelligence to be able to say whether or not the estimate which you have given includes any allowance of any kind to the owners of patents, either in the cost of original construction or in the operation subsequently. A. I have previously answered that question, but will state again that I have made allowances for no royalties or fixed compensation in my estimate for Washington.

Q. Then please describe the switchboard which is covered

by your estimate of thirty-four thousand and odd dollars. A. The switchboard which I have estimated upon, and for which I have given a figure of about thirty-four thousand dol-
1297 lars was taken at that figure as the switchboard commonly known as the multiple switchboard, and which has been very generally installed by the Western Electric Company for a number of years.

Q. Please describe it and its operation.

Mr. BIRNEY: Objected to for the reason that the board in question has been repeatedly described in the testimony already taken; that that operation is detailed in the testimony of witnesses for the defendant and is not contested in any way, and the question therefore becomes wholly unnecessary and immaterial.

A. In brief, the switchboard consists of several sections, at each of which several sections a certain number of the subscribers' telephone lines terminate in apparatus which will allow a calling signal to be transmitted to the central office, and connection established with the calling party. Beside this incoming call apparatus, each of the sections is equipped with apparatus which allows communication to be established with any one or all of the subscribers in the exchange. That is, the latter portion of the equipment is duplicated at each section. It is thus possible for a subscriber to secure direct communication with any other subscriber in the exchange, passing through but one operator.

Q. You have spoken of this last type of board which the Western Electric Company has been installing. Are you acquainted with the construction of the switchboard which, within the last two years has been put in operation by
1298 that company in Cleveland, and in Louisville and in Indianapolis? A. I am familiar with the type of switchboard referred to, which is a modification of the style of switchboard which I understand to be in use in Washington and which I have described.

Q. What are the modifications? A. The principal difference consists in the method of signalling the exchange, and in supervising the connections existing between the subscribers by means of standard signalling devices, usually lamps, and besides that, in the three places mentioned, I believe, although I will not be positive, that the so-called central battery system has been introduced. This system is one in which the batteries at the subscribers' station are done away with, and all of the talking battery located at the central office.

Q. In the exchanges in the three places referred to, is it not a fact that the batteries in the subscribers' office are done away with, and that when a subscriber takes the receiver of

his telephone from the hook, he signals the central office that he wishes to communicate with somebody, without turning any crank or ringing any bell at his station; and is it not also the fact in those systems that when two subscribers, who have been talking with each other, have concluded, and hung up their respective phones, each one by that act signals to the operator that he is through? A. As I understand and have been informed such is the operation of the exchange apparatus in the three cities mentioned.

1299 Q. In your opinion, are these changes improvements? A. I think that it is an improvement to place the subscribers' batteries at the central office, because the cost of maintenance of subscribers' station apparatus is very materially reduced by so doing; and I also think that there are advantages in allowing each subscriber to independently signal the exchange so as to inform the operator whether one or both have finished the conversation and have hung up their telephone. It appears to me, also, as perhaps advantageous to transmit the calling signal by the mere act of raising the telephone from its hook.

Q. Do you know whether these several improvements are covered by patents? A. Certain of these methods of operation or systems are, in my opinion, not only patentable, but I believe have been patented by the American Bell Telephone Company or by the Western Electric Company.

Q. Do you not know, Mr. Dunbar, that every detail of the telephone exchange from the subscribers' instrument to the final operation in the central office is covered by a lot of patents, and that it is impossible to construct a telephone exchange system with the latest and best improvements without either infringing a number of such patents or running the risk of litigation in reference to them? A. I was not aware that such was the fact, although I have spent a number of years in very close examination of the patents owned and controlled by the Western Electric Company and the Bell Telephone Company and its lessees.

1300 Q. What parts of a telephone system are covered, for instance, by Mr. Kellogg's one hundred and odd patents? A. Off-hand, I could not begin to enumerate all of the details covered by the patents owned by Mr. Kellogg.

Q. To what extent have you familiarized yourself with the contents of patents which have been issued in Washington in the last year on instruments or appurtenances used in a telephone exchange? Can you approximate the number of such patents, for instance? A. I know that I have not examined all of such patents issued during the last year, but I have probably looked over three or four hundred of such patents, and should

judge that there were a number of hundred others which I have not looked at.

Q. Now, about the city of Washington. What is the proportion, in that city, between the whole area of the city and that part of it which is occupied by streets, avenues, alleys, reservations, parks and other public places? A. As I have stated before, I could not give this proportion, but I am familiar enough with the city to know that the business portion of the city is concentrated as in the majority of other cities in this country.

Q. Please give the boundaries in that part of the city of Washington which you refer to as the business part. A. I am not familiar enough with the city to give the boundaries, but I would state that from Sixth to Seventh streets and from Thirteenth to Foureenth sreets would include a greater
1301 portion, as I remember it, of the business portion of the city, business portion, of course, referring to the telephone business portion and excluding the residence district.

Q. Are you aware of the fact that what was formerly known as Georgetown is a part of the city of Washington and included within the limits of the exchange there? A. I did not know that Georgetown was a portion of the city of Washington.

Q. Are you aware of the fact that a large part of the business district of Washington City is on Capitol Hill? A. I was not aware that the largest portion of the business portion was on Capitol Hill. How large such a portion is I couldn't tell exactly.

Q. When you made your estimate of the cost of reproducing the existing telephone plant in Washington did you have before you any map of the city showing where the conduits and overhead lines of the existing company ran? A. I did not, nor was it necessary to so have, because in the Exhibit "L," to which I have referred, a detailed statement is made of the ducts, including the number of ducts per cross section of conduit, including the mileage of the ducts, including the mileage of the conduit, and also a detailed statement is made of the mileage of cable, one-hundred pair, fifty-pair, twenty-five-pair, ten-pair, etc.; and from this information (which information is the best possible guide upon which to base an estimate) I was able to figure very closely the mileage of ducts and mileage of cable, and percentage of large cables and small cables
1302 and the percentage of conduits with a large number of ducts, and the percentage of conduits with a small number of conduits very closely.

Q. Does the character of the pavement of the street have anything to do with the expense of installing a conduit telephone system in it? A. It does, and in my estimate I was care-

ful to figure out from the detailed statement made the average cost per mile duct of the existing plant as shown in the detailed exhibit; and in my estimate I assumed a figure about twenty per cent higher per duct mile than that shown by the detailed estimate.

Q. When you say the detailed estimate to what do you refer? A. To the detailed statement of Exhibit "L."

Q. You mean you have allowed twenty per cent more for the cost of laying the conduits in Washington than Mr. Crenshaw has, according to that exhibit? A. Yes, sir; per mile duct. This was done not only to be on the safe side, but because, as the mileage of ducts given in this table of Exhibit "L" was excessive for the number of telephones which could be handled by the switchboards at the central offices, and as I reduced the total number of mile ducts to a figure which would accommodate something like 3,000 subscribers, I added the additional twenty per cent to partially take care of the increased cost per duct mile which would result from a smaller total duct system. I also assumed a figure in excess of the cost of duct construction in several of the larger
1303 cities in which underground systems have recently been placed.

Q. What is the depth of the conduits used by the Telephone Company in Washington—I mean below the surface of the street? A. I don't know the exact depth, nor was it necessary for me to so know on account of the detailed statement contained in Exhibit "L," which contained all the information which it was necessary for me to base my estimate upon.

Q. Your estimate, then, as to the laying of conduits in Washington, is based upon Exhibit "L"? A. Certain factors, which I could not determine without being in Washington, were based upon Exhibit "L;" but those other factors I took from my knowledge of what it has cost to install subway plants in other cities.

Q. What were the factors which you got from Exhibit "L," and what were the factors which you got from some other source? A. As I have just stated, the relative distribution of the ducts, including the relative number of ducts per cross-section of conduits, the total mileage of both ducts and conduits, I secured from Exhibit "L," while the cost of laying the ducts, the mileage of ducts that would be required, and the cost of such duct construction, I had secured by prior investigation.

Q. How can you tell the cost of laying ducts in Washington if you do not know how deep they are to be laid? A. As I have stated, I have assumed in my estimate a cost per duct mile considerably greater than that shown for the cost per duct

mile in the table of Exhibit "L." Aside from this, and
1304 while I do not know the exact depth which the conduits are required to be placed below the surface in Washington, I am confident that my figures would cover all additional expense per duct mile which might arise from putting the ducts several feet lower in the ground in Washington than has been done in many other of the cities.

Q. What would be the cost at the present time per lineal foot of laying a conduit containing two ducts of the ordinary size, eight feet below the surface, on a street covered with sheet asphalt pavement? A. That would, of course, depend not only upon the miles of such two-duct conduit which were laid, but also upon the amount of other conduits which were to be laid at the same time; but in general I would state that to lay two ducts in a single conduit eight feet in the ground and under an asphalt pavement, as requested in the question, would cost in the neighborhood of 60 to 70, or perhaps 70 to 80, cents per conduit foot. The principal factor in this excessive cost per duct foot is due to the labor of excavating, refilling in and repairing the pavement. If 20 or 25 or more ducts are placed in the same conduit, the cost per duct foot would naturally be much decreased, perhaps to not over 9 or 10 cents per duct foot.

Q. Does that estimate per duct foot include the price of the conduit itself? A. It does.

Q. As I understand you, there is very little additional expense in adding ducts when you once open the trench
1305 to lay a conduit? A. The tendency, of course, is strongly that way, because the principal labor is in excavating, filling up, repairing, etc., while the actual cost of the duct itself per linear foot is comparatively slight.

Q. In your judgment, would it be good policy when putting down conduits for a telephone exchange of 2,200 subscribers to make no greater provision for the future in the laying of those conduits than to have room for 3,000 subscribers' wires? A. If the capacity of the switchboard installed in the central office did not exceed 2,200 subscribers, I would not consider it good policy to provide a duct capacity for a greater number than say 3,000 subscribers.

Q. Then when the number of subscribers passed 3,000, and you had to have a new switchboard, you would likewise have to tear up the streets again to lay new conduits, would you not? A. If it were at all probable that the number of subscribers was to exceed 2,200, or to reach 3,000, it would not be good policy to put in a switchboard of a capacity of 2,200 only. The best policy would be to put in a switchboard and also a duct capacity great enough to accommodate an increase in the number of subscribers such as was to be expected in the near future.

Q. In your experience, what is the average life of a switchboard in an exchange in a large city? A. The life of a telephone switchboard in the large cities in this country
1306 which have been operated by the American Bell Telephone Company licensees have been comparatively short. In some cases a telephone switchboard has become out of date about as soon as its installation was completed. More switchboards in the American Bell Telephone Company's systems, I think, have been replaced on account of their being out of date than on account of having given out through wear and tear. I would not be able to give the average life of a telephone switchboard in the large cities.

Q. You have, for some reason which I do not know, confined your answers to switchboards in use by licensees of the American Bell Telephone Company. My question was addressed to switchboards in general. A. I have necessarily confined myself to the exchanges which have been operated by the American Bell Telephone Company licensees, because there are no large cities in this country in which telephone switchboards have been installed by other companies a sufficient length of time to secure any positive information. From this time on I should consider that the average life of telephone switchboards would be determined more from their true wear and tear than by throwing them out to install switchboards of different types.

Q. What is the average lifetime in your experience of underground conduits, such as you have estimated for in Washington? A. The style of conduit which I have estimated upon for Washington is, as far as I can judge from results, if not indestructible, very nearly so, and will have a very small depreciation. I think 1 per cent, or 1½ per cent per annum would
1307 be ample to charge for depreciation of the conduit system.

Q. Then why do you say in the conduits you should provide for but a few years' growth of an exchange, because you have done so with the switchboard? A. I have stated that it would be the correct policy to provide capacity enough, as well as in the switchboard, to accommodate the growth of the subscribers that might be expected in the near future. It necessarily costs more to put in 70 ducts than it does 25 or 40, and considerably more. It is only when you come to compare the difference in cost per duct foot of a one, two or three with a fifteen or twenty duct conduit, that the big discrepancy in the cost per duct is developed. When you get above fifteen or twenty ducts per cross section of conduit, the cost of the conduit system increases nearly in direct proportion to the number of ducts added. Thus, if 20 ducts per cross section of conduit

should cost 10 cents per duct foot, then 70 or 80 ducts per cross section per conduit would cost probably 9 cents, or close to 9 cents, per duct foot. It is on account of the increased cost of installation, as the conduit system is unnecessarily and exorbitantly increased in capacity that I do not consider it necessary, in laying a conduit system, to provide for a far greater number of subscribers than can be accommodated in the near future.

Q. What do you mean by the near future? Give us approximately the time in years. A. I should say from three to five years, or perhaps from two to five years.

1308 Q. Then your project is that from every two to five years, or from three to five years, the streets should all be torn up anew for the purpose of laying additional ducts, if the exchange continued to grow? A. That time limit would depend, of course, wholly upon the relative cost of letting a certain amount of capital lie idle for a certain length of time, and the increase in cost of installing the additional equipment at the date it would be required.

Q. You do not consider, then, at all, the wishes of the authorities, or the convenience of the public? A. Such conditions, of course, should be considered with their due weight.

Q. Do you know whether or not at the present time in Washington any company would be allowed in installing an underground system, whether telephonic exchange or electric, to provide only for three to five years' growth, with the understanding that at the expiration of that time the streets would all be torn up again? A. I do not know. In reference to the tearing up of the streets and the inconveniences caused to the public, it would be perfectly feasible for any telephone company to provide additional equipment in excess of what might be required in two years, in such places where inconveniences would be caused by re-digging at that point. The period that I give as from two to five years or from three to five years is a figure which I have stated should be determined in a certain manner, and I would limit it either to a minimum of two years or a maximum of five years.

1309 Q. You would simply have the streets torn up whenever it was convenient to the telephone company to have it done?

Mr. BIRNEY: That is objected to as having nothing to do with the case.

A. I have distinctly stated that such considerations, the convenience of the public, etc., should be given due consideration.

Q. Do you know on what streets the conduits, or any of them, the cost of which is indicated in Exhibit "L" were laid? A.

The location of conduits in particular streets is not given in Exhibit "L," and I do not know upon what streets they are located.

Q. I wish you would state in detail the calculation you have made, the result of which is that you think the duct capacity of the underground plant covered by Exhibit "L," would accomodate an exchange of from 9,000 to 13,000 subscribers? A. The total number of duct miles is given, as I remember, as 132. If 100-pair cables were uniformly drawn into this entire conduit system, you would have provision for 13,200 miles of metallic circuit. Assuming that each subscriber's circuit averaged as great as one mile metallic circuit in the cable system, this would then give capacity for over 13,000 subscribers in the duct system. If we assume that the ducts are partially filled with 100-pair cable, 50-pair cable, 25-pair cable and 15-pair cable, and about in the same ratio as are the cables installed as
1310 shown by the Exhibit "L," then the capacity of the cable equipment would be over 9,000 miles of metallic circuit, which again, assuming the excessive cable mileage length per subscriber of one mile, would give a subscriber's exchange equipment of over 9,000 lines. If, now, cables of a larger number of pairs, such as 120-pairs and 150-pairs, which have been found advantageous to use, were employed, the capacity of the duct system for a subscribers' circuit would be still further increased.

Q. What do you understand to be the size of the ducts in the Washington conduits of which you have been speaking? A. A sufficient size, uniform, to pull in a cable $2\frac{3}{8}$ or $2\frac{1}{2}$ inches in diameter.

Q. If the number of the subscribers connected with the Washington exchange were increased from 2,200 to 9,000 or 13,000, whether the conduits now laid would accommodate them without additional conduits or overhead wires, would depend, would it not, upon whether the additional subscribers would grow up around or along the lines of the conduits? A. It would necessarily be so; and it would be an extremely unwise policy to put in a large conduit capacity without a definite belief that such conduit capacity could be ultimately used.

Q. That, I suppose, could be best determined by a knowledge of the facts from which one could determine whether there would or would not probably be a growth in the neighborhood corresponding to the increased number of conduits. It would depend, I mean, upon local conditions? A. It certainly
1311 would so depend.

Q. As to that point, I understand you have no knowledge because you do not know where the conduits run? A. That is it.

Q. Will you please look at Exhibit "L," to which you have referred, and tell me in the first place as to the items which precede the entry, "Total value of cable, $65,582.91," whether you differ with Mr. Crenshaw, and, if so, in what respect? A. I would make little criticism on the prices given in reference to the 150-pair and 50-pair cable, and, in fact, would scarcely criticise the prices given for the 25 and 10-pair cable. These prices may be a little high, but not higher than an engineer making a careful estimate might consider as proper.

Q. What is your opinion as to whether the amount of cable of different kinds specified by these items is reasonably necessary for an exchange of 2,200 subscribers in Washington constructed as that exchange is? A. I would consider that there was a greater percentage of spare or idle wires in the cable equipment therein shown than would be necessary to perfectly serve 2,200 subscribers in Washington, D. C.

Q. What would you call a reasonable proportion of idle cables to provide for the future? A. In my estimate, I have assumed that the average length of each subscriber's metallic circuit, all circuits being metallic, was 6-10 of a mile in the cables, about 14-100 or 15-100 of a mile aerial before reaching
1312 the house top or other terminal, and that the average length of terminal wire reaching to and connecting with the inside wiring was about 400 feet, or about 8-100 of a mile, making in all an average length of subscriber's metallic circuit of 82-100 or 83-100 of a mile. Of course a great number, in fact, probably the greater number of the subscribers, would be served from the underground system; while a certain other smaller percentage of subscribers would be partially served with a greater percentage of aerial construction. With this supposition, which I consider is an outside figure, I would consider that 2,500 subscribers' circuits, each estimated at 3-5 of a mile on the average in the cable system alone, would provide a sufficient number of spare wires and spare miles of wire to thoroughly serve 2,200 subscribers, and with a growth to perhaps 2,400.

Q. Where do you get your figures, 6-10 of a mile, 14-15 of a mile and 8-100 of a mile, upon which the calculation contained in your last answer is based? A. Taking the average length of the subscribers' circuit as from 82-100 to 83-100 of a mile, I have divided the average circuits into subways and aerial construction in practically the same ratio as it may now exist in Washington. Such ratio between the aerial and subway construction would be altered, or might be altered, at the time of the installation of such a system; but I have allowed a large percentage of line wire construction and a considerable maintenance, so as to be on the safe side on the estimate of outside construction.

1313 Q. Where do you get the figures 82-100 or 83-100, referred to in your last answer? A. In a great number of large cities in this country I have made careful estimates upon the average length of each subscriber's conduit, and have found that if a telephone central station be located in the neighborhood of the business portion of the city, the average length for every circuit running into the exchange varies but little from an average of about 70 to 75-100 of a mile, although in certain places there is an excessive length on certain subscriber's circuits which, of course, is counterbalanced by a larger number of circuits with short lengths. Also, in reference to the testimony of the witnesses Crenshaw and Crandall, and in connection with the lay-out of the ducts and the cables, that is, the percentages of the different sizes of cable and the percentages of the different ducts per cross section of conduit, I am confident that the figure that I have assumed of 82-100 or 83-100 of a mile is an outside figure for the subscriber's circuit in Washington, D. C.

Q. You are quite confident that the same conditions which obtain in other cities as to regulating the average length of subscribers' wires obtains in Washington, are you? A. From my memory of Washington itself, and particularly from a study of Exhibit "L," I am confident that Washington does not vary particularly in the average length of each subscriber's circuit from other cities in this country.

Q. Will you please look at Exhibit "L," which I hand you, and point out what there is in that exhibit bearing upon
1314 the matter referred to in your last answer. A. Beginning with the cable lay-out, it will be noticed that there is about 39,000 feet of 100-pair cable, and about 54,000 or 55,000 feet of 50-pair cable, and a much smaller number of feet of 25-pair and 1-pair cable. This is exclusive of the aerial construction. From these figures alone and from the methods in which the subscribers' stations are dropped off from the cables in a telephone system, and from the fact that in the same exhibit the mileage conduit of a certain number of ducts also agrees with the cable system as laid out, I can see that the average length of each subscriber's line cannot be in excess of the figures which I have named.

Q. In your estimate of the cost of building an underground plant in Washington, how many manholes do you allow? A. I believe that it is in the neighborhood of 25 to 30 manholes, at a cost of from $90 to $95 per manhole.

Q. How do you arrive at that number of manholes as being sufficient? A. The number of manholes, of course, depends very closely upon the number of lines along which the duct system is laid, and upon the street crossings, etc. I do not at

this moment remember the exact number of junction boxes. By being provided with the same data and taking time, I can re-estimate and tell more closely the number of manholes, junction-boxes, etc., which are allowed.

1315 Q. Is the number of manholes governed by the length of the conduit or by the number of ducts, or both? A. More by the number of conduits than by the number of ducts. It also depends to a certain extent upon the number of ducts per cross section of conduit, as that would determine the ease with which all circuits of cable might be drawn in.

Q. What is the average distance between manholes along underground telephone conduits? A. It depends not only upon the average number of blocks to the mile in any given circuit, but also upon the particular routes or lines along which the conduit system is planned and upon the facilities which the telephone company may be able to secure for passing through streets or alleys, or reaching certain corners from which a more equitable distribution of cables may be secured. To be more definite, very frequently manholes are located a quarter of a mile apart and in other cases they are located in every block, which may be but 300 feet or less.

Q. What is the average length of the blocks in Washington along which the conduits of the defendant company run? A. I have no absolute knowledge concerning the length of blocks, except simply as I remember them. I would estimate perhaps that they were 400 feet, but in my estimate of the number of manholes I remember doing as I did in all such cases, allowing a figure greater than I would consider absolutely necessary for Washington.

1316 Q. What do you know as to the particular routes or lines along which conduits in Washington plants are constructed? A. I am not familiar with the routes or lines upon which the conduit system is constructed.

Q. What do you know as to the facilities which the Chesapeake & Potomac Telephone Company has in Washington for reaching certain streets or alleys or corners which would affect the number of manholes required of it? A. Nothing absolutely, except I had before me when I made the estimate the Exhibit "L," showing the number of man-holes actually in Washington at present, which of course, is the key to the various items which I have enumerated above.

Q. If that is so, how did it happen that while you allow for but 25 or 30 man-holes, Mr. Crenshaw, in Exhibit "L" allows for 223? A. The principal differences are that in Exhibit "L" I understand the trunk lines or toll lines are also included; that as I have already stated the sub-way system is several times greater than the system which I have assumer; and finally, as I

have already stated, the exact number which I allowed in my careful estimate I have not at present in mind; but that number was determined with a due consideration of the actual number of man-holes which were shown in the Exhibit referred to.

Q. Do you know whether the toll lines of the defendant company in Washington pass through the same conduits as the lines of the subscribers to the exchange? A. I should be surprised if they did not pursue the same line of conduit as the subscribers' stations for some distance after leaving the central office.

1317 Q. Do you know whether they follow the same route as far as the conduits extend? A. I would naturally understand that the toll lines would take the same conduits that were occupied by whatever subscriber's lines might be reaching in that direction of the toll line circuits.

Q. What knowledge have you as to whether there is an extra manhole required in Washington owing to the fact that the toll lines occupy ducts in the same conduits as subscribers' lines? A. The greater number of miles of ducts in any given city, the greater will be the number of manholes required to furnish facilities for pulling in and out cables in these ducts. That being so, the number of manholes would naturally be increased if there was an extra cable system providing toll lines or trunking facilities from Washington out. How great this toll line or trunking system may be it matters little in my estimate, as such toll and trunk lines are included in my estimate, and as I have given the figure on the cost of the construction of the manholes, junction boxes and other equipment, fully sufficient to include all manholes that would be necessary to handle the number of subscribers on which I have estimated, that is, 2,200 subscribers.

Q. Do you know whether there are any regulations in force in Washington governing the construction of manholes or underground conduits? A. I should be surprised if there were not some such regulation, but I have no knowledge of

1318 the fact.

Q. If you do not know how they are to be constructed how can you tell what they will cost? A. I know that manholes sufficient to answer the requirements in any city of which I have any knowledge whatever can be built at from $85 to $95 apiece.

Q. Describe in detail the construction and material of manholes covered by your estimate of $85 or thereabouts, giving dimensions. A. I have not gone into the refinements, nor have I considered the depth of the manholes or the width or breadth, except in so far as they will be sufficiently large to accommodate the number of ducts I have laid out in my estimate. In

other words, I know that manholes in other cities can be constructed and have been constructed at figures which I have given, taking in a duct capacity in excess of that which I have allowed for Washington; and the question of dimensions, material, covers, whether waterproof or not, are items which will vary but little the cost of laying a considerable number of these manholes, provided, of course, that first-class construction shall be put in in all cases.

Q. How many telephone poles have you allowed for in your estimate? A. I allowed a total of about 21 miles of pole construction, averaging 140 poles to the mile, carrying 15 pairs of metallic circuit copper wires. This is the average number of pairs of circuits which would be carried upon the said number of poles, although in certain localities the number of pairs of wires on each pole would be materially greater than 15
1319 pairs, and in other cases would be materially less than 15 pairs.

Q. What is the height of the poles, the cost of which you have estimated? A. I have assumed certain of the poles to be not over 25 feet in height, and other of the poles to reach as high as 70 feet or even 75 feet. I have allowed for the full number of poles an average cost of $6 per pole, which is excessively high for the 25-foot poles and is low for a 75-foot pole, but is an average which, if anything, is greater than the average pole would cost for such a line system as I have estimated upon for Washington.

Q. Does your price of $6 per pole include the pole alone or the pole set? Can you not tell that without reference to your memorandum? A. As a general thing, I do not carry all details of calculations in my head day after day. The figures which I used were $6 on the average for a pole set, but not provided with cross-arms or wires, and is an average of 140 poles to the mile.

Q. Of what kind of wood are your poles supposed to be? A. I used a chestnut, or, in fact, for the price given, almost any pole that could be cheaply brought to Washington could be purchased.

Q. What did you allow for the cross-arms and other appurtenances, not including the wires themselves—including everything but the poles and the wires? A. About 75 cents per cross-arm I have taken as an outside figure, which includes one cross-arm completely equipped with pins and insulators,
1320 bolted on to the pole and provided with braces as is customary.

Q. How many cross-arms do you allow to each pole on an average? A. Two on the average.

Q. Then please give me the average cost of your pole, set

and equipped ready for the wires. A. On the average about $1,050 per mile.

Q. Do you know whether or not there are any regulations in force in the city of Washington governing the height and construction of telephone poles? A. I do not know so from absolute knowledge, but I should expect that there were regulations of that sort.

Q. How many miles of wire, and of what kinds, have you allowed for in your estimates, so far as relates to the overhead part of the plant? A. I have assumed both a No. 12 B. & S. copper wire (about .0808 inch in diameter), and a No. 12 N. B. S. G. wire (.104 inch in diameter), the greater preponderance of this wire being the No. 12 N. B. S. G., and all the wire being taken uniformly at a cost of $25 per mile, which is a little low for the No. 12 N. B. S. G., and considerably high for the No. 12 B. & S. As I before stated, the average number of metallic circuits which I have assumed on the full 21 miles of overhead construction was 15. This, then, would make 630 miles of copper wire. In this estimate I have also excluded any figures on the use of aerial cable in connection with this pole line, and for the following reasons: The aerial cable, where there is a large number of the metallic circuits to be carried overhead
1321 is much cheaper to install and to maintain than the line wires, and also the poles are less expensive to install and maintain; consequently, by the use of aerial cable construction, where it may be advantageous to use it, it would cheapen both the cost of construction and of maintenance over the figures which I have given in my estimate.

Q. What have you allowed, if anything, as the cost of stringing the 630 miles of wire, ready for use? A. I have allowed about $5 a mile.

Q. Have you ever constructed or superintended the construction of an overhead plant like this? A. No, sir; I have not.

Q. In the estimate which you have made of the cost of a switchboard, have you made any allowance for any alteration that might be required in the building in which the switchboard is installed, or have you supposed the case of a building already provided for telephone exchange purposes? A. I have given what I would consider an outside figure, both on the cost of telephone switchboard itself and on its connections from the cable heads to the distributing boards, and the figures are high enough, I believe, so that if any alterations were necessary in the building for the installation of such apparatus, it would be practically covered by the cost of these two items mentioned.

Q. How many companies are there in the United States which furnish and equip switchboards of the kind which you

have told us you have estimated for? A. Up to date no
1322 company, except the Western Electric Co., that I know of, has constructed or installed a board exactly similar to that which I understand is installed in Washington. The cost of such a switchboard as that which is now installed in Washington is greater, considerably, than the cost of switchboards which have been generally installed by manufacturing companies and for telephone companies, outside of the—

Q. Are you under the impression that you are now answering my question? A. Certainly.

Q. I call your attention to the question, and suggest that you are very much mistaken. If you will leave the argument of the case to counsel and answer my questions, we will get along much faster. A. Please read the question again.

The question was repeated, as follows:

Q. How many companies are there in the United States which furnish and equip switchboards of the kind which you have told us you have estimated for? A. (Continuing) Outside of the American Bell Telephone lessee companies. From about this date on, on account of the expiration of certain fundamental patents, I think it quite likely that certain companies will manufacture switchboards very closely resembling the type of switchboard put in in Washington, and it is for this reason that I consider it possible for a number of companies from this time on to put in a telephone switchboard of
1323 practically the same design as is now in Washington, and which will give practically the same service, that I base my estimate upon a switchboard of this class.

Q. What patent or patents do you refer to as having recently expired? A. In particular, to the Firman patent, which I believe has expired or is to expire this month.

Q That patent covers a multiple switchboard? A. The first claim of the Firman patent was, broadly speaking, for a multiple switchboard.

Q. Do you know what kinds of telephones are in use in subscribers' stations in Washington in connection with metallic circuits for long distance use? A. I had understood from an examination of the portions of the testimony to which my attention has been directed that they were of various styles, and principally those of the ordinary wall style, or wall set, as it is commonly known. I should also judge that there were certain styles of sets which have been known commonly as cabinet wall sets and cabinet sets, etc.

Q. Do you know what form of transmitter has been used in those instruments? A. I had supposed that one of the customary forms of long distance transmitter made by the American Bell Telephone Co. had been used, probably the so-called solid-back transmitter.

1324 Q. In your estimate for the cost of the equipment of subscriber's stations have you included telephones of that kind? A. As I have previously stated, I have done so. When I say instruments of that style, I do not of course mean instruments exactly of similar construction, but I do mean instruments of a construction such that they will produce practically the same commercial results as the American Bell instruments referred to.

Q. And which, as I understand you, would be as available for long distance intercourse as the solid back? A. You are right.

Q. What instrument is that? Please describe it so that it can be identified. A. The Ericson Telephone Co., also the Stromberg and Carlson Telephone Co. and several other telephone manufacturing companies in this country have manufactured and sold and are selling transmitters of this make.

Q. Have they a name which will designate them without a description of their construction in detail? A. The Ericson transmitter is generally known simply as the Ericson transmitter, and the Stromberg Carlson transmitter is simply known, I think, as the Stromberg Carlson long distance transmitter.

Q. Is the Stromberg Carlson Company a Chicago company? A. They have a Chicago house.

Q. I thought I understood you in your direct examination to say or intimate that the recent tendency in telephone ex-
1325 exchanges is to have more than one exchange in a city instead of the tendency to concentrate into one, where that is practicable. Am I correct in so understanding you? A. I do not think that is exactly the view that I expressed, but I will state that I understand that the American Bell lessee companies have in a great number of the large cities of this country one or more, and, in fact, several telephone exchanges; and in certain of these cities it would be impracticable to concentrate all of the lines into one exchange and still use the type of switchboard which is in common use by the lessees of the American Bell Telephone Company.

Q. Meaning the multiple switchboard? A. Yes, for this reason: There are a great many branch exchanges in the different large cities of this country, and on the question as to whether it is advisable or not to bring as many subscribers into one exchange as is possible, I have not intended to express an opinion.

Q. I did not so understand you, but I thought I understood you to say that the tendency in carrying on these exchanges is in the direction indicated. Did you mean to express such an opinion. A. No, I would state, on the contrary, that in certain cities it has been considered advisable to concentrate the sub-

scribers to one central point as far as possible, and, in fact, in St. Louis, as I believe I have already spoken of, all the subscribers' lines in the Kinlock Telephone Exchange are brought to one switchboard; that is, into one switchboard.

1326 Q. Are you aware of the fact that in Paris a multiple switchboard has recently been installed which has now 10,000 subscribers' wires connected with it, and that it is proposed to increase it to nearly double that capacity? A. I am not familiar with the board, but have already heard statements in regard to it; but I do not undestand that it is the same style of construction that has been generally used here in this country by the Bell Lessees' Companies.

Q. Do you know its construction and operation in a general way? A. No more than in a general way. I understand, to begin with, that the jacks are a smaller distance on centers, both vertically and horizontally; but other than this I have no direct information. In fact, I have not considered the question of this board that you speak of.

Q. Do you know what has been so far in this country the limit of the number of subscribers whose business could be handled in one exchange where the multiple was used? A. I do not remember at present of any switchboard in the American Telephone Company's system which has as many as 6,000 subscribers' lines wired to it, and with the exception of the plant at St. Louis belonging to the Kinlock Telephone Co., and possibly the exchange in Detroit belonging to the Independent Telephone Co., I know of no exchanges with over 6,000 subscribers' lines brought into one switchboard.

Q. Are you aware of the fact that here in Chicago, where a divided switchboard has been used, it is proposed to sup-

1327 plant it with a multiple switchboard, because it has been the result of their experience here that the multiple board is more satisfactory? A. I was not aware of the particular case to which you refer, but I have been aware that the policy has been with the American Bell Telephone Company and the American Bell lessee companies to install multiple switchboards in preference to divided exchange boards and trunking boards of various descriptions.

Q. I understand you in your direct examination to say that you designed and installed what is known as the Kellogg switchboard in use in St. Louis. Is that right? A. I think I have already stated that the design of the system is covered by the patents to Mr. Kellogg, and that in that sense Mr. Kellogg is the designer of the system which has been introduced here. My work, as I thought I had made it clear before, was designing the mechanical parts of the different pieces of apparatus which were installed in the board.

Q. In your examination in chief you have referred to the fact that in Boston, New York, Buffalo, Philadelphia, Brooklyn, Chicago and other cities there are sub-exchanges connected with the central exchange. Do you know to what extent that is due to the limited capacity of the boards in the main exchange or to a supposed economy resulting from the shortened average length of subscriber's line? A. I do not know positively; but from the fact that in certain cities and in
1328 certain portions of certain cities I think it would be possible to readily increase the capacity of the switchboards in certain exchanges and thus do away with some of the subordinate exchanges—

Q. You perceive you are departing from my question, which is whether you know what has governed those people who are operating those exchanges in having more than one, and whether you know if they have been affected by the considerations mentioned? A. I have no absolute knowledge of the judgment of those people who determine the location of the various exchanges mentioned in the question.

Q. In your estimate of the cost of a switchboard in Washington, have you allowed for any room for an increase in subscribers or is the board, the cost of which you have estimated, one, the capacity of which would be limited to 2,200 subscribers? A. I suppose that there was sufficient switchboard room available to give an increase in the number of sections of switchboard, and I have also assumed that the switchboard sections were capable in themselves of an increased equipment.

Q. Capable of an increased equipment to accommodate how many subscribers in all? A. That would cut very little figure in reference to the total cost of the switchboard itself, as it would merely increase or decrease the height of the frame of the section. I have not fixed any ultimate capacity to each section of switchboard.

FRANCIS W. DUNBAR,
By the Examiner, by consent.

1329 Subscribed and sworn to before me, this —— day of ———, 1899. ———— ————,
Examiner in Chancery.

The further taking of these depositions was thereupon adjourned until Thursday morning, January 19th, 1899, at 9 o'clock a. m., at the office of the Western Telephone Construction Co.

1330 Office of the Western Telephone Construction Co.,
No. 250 S. Clinton St., Chicago, Ill.,

Thursday, January 19th, 1899, 9 o'clock a. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney.
Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

Cross-examination of JAMES E. KEELYN resumed.

By Mr. WORTHINGTON:

Q. Have you found the journal referred to as "J" in the account of the Ft. Wayne Telephone Company in 1896 and 1897? A. I have not yet found from the journal, but would like to know the specific items desired for examination in the journal, so that I might be better able to trace it up.

Q. There are several things I want to ascertain. One of them is what you charged in detail for the equipment with which that Fort Wayne Company started its business. You have given the prices at which your company furnishes various instruments and appurtenances, and I want to see whether that company was charged full price. I do not want your recollection of the facts, but I would like to see the entries or the papers which will show that. A. That is, the price which we are charging them for a telephone instrument complete?

1331 Q. No; the price you did charge them, not what you are charging now. I am referring to the original company. A. I will look and see if I can find some paper which will give this information.

Q. Would not the contract between you and that company, which you refused to produce the other day, disclose the facts which I refer to? A. I believe not. I do not believe the contract will show specifically the cost of the telephones separately from the switchboard, and yet I may be mistaken in this.

Q. Suppose you produce the contract and let us see how it is about that. A. I object to producing the contract for the reasons set forth. If the contract will show that specific thing, and it is desired to examine it only for that specific thing, I would not be averse to showing it. If the counsel are satisfied to examine the contract for that purpose only, I might be willing to exhibit the contract sufficiently to show what I have testified to in that respect; but I do not believe it indicates separately the cost of each particular telephone or of each switchboard drop, and yet it may.

Q. Then you are willing to produce that contract so far as

relates to matters upon which it throws no light, but are not willing to produce it with reference to matters to which it does relate. Is that it? A. I hardly see the sense of the counsel's question. What it would throw light on or what it would not throw light on is not intimated by the counsel's question.

1332 (The witness at this point left the room and subsequently returned.)

The WITNESS: Not wishing to be under the ban of reluctance to furnish any information which would be reasonable for me to give in view of my present position as President of a corporation, and exercising control of its papers between its customers, I have undertaken to search for and obtain the contract referred to. While I have, for reasons of preventing a precedent, refused to divulge what I thought was the private business of this company, I now submit this contract for examination, as heretofore stated, with reference to the distinction of telephone prices or details. The contract is now submitted for examination, with the request that if the counsel does not find therein the particular statement of prices mentioned by him in his question heretofore, that he does not incorporate it in the record. The contract is submitted.

Mr. WORTHINGTON: Counsel for defendant state that they refuse to receive or to examine the paper which the witness has just handed them with any such limitation as he has just stated.

The WITNESS: Then the contract is submitted for examination, believing that if not submitted, the witness would be under the cloud of reluctance, and therefore does not object to its full submission under the circumstances. The witness expressly requests of the court having charge of the case that the contract referred to may not be incorporated into the public records, unless the court deems it necessary for the pur-

1333 poses of evidence in this case that it should be so incorporated. The contract is submittted for copy as the records of this company require the original to be retained by it.

By Mr. WORTHINGTON:

Q. (After examining contract.) I see by this contract that the consideration which the Fort Wayne Company was to pay your company was $20,000. When was the last payment made on account of that $20,000? A. (Producing a paper.) The statement heretofore asked for—

Q. This is a copy from the ledger, is it not? A. The statement of the ledgers of the company, a copy of which was asked for and given, indicates these payments.

Q. Since you have that statement before you, I wish you

would answer the question from it, for I do not find it in the account myself. A. I am unable to say definitely myself just when the last payment was made, other than as indicated by the ledger account.

Q. Then is it a fact that the instruments and apparatus which you subsequently furnished to the Fort Wayne Company went to the same general account of $20,000 due on the original contract, and that in the application of payments thereafter made, no distinction was made between indebtedness under the contract and indebtedness for instruments and apparatus subsequently furnished? A. I believe that both accounts were run as one account.

Q. And the account was not settled until the 1st of
1334 September, 1897? A. It would appear to me from this statement that the last payment or credit under the account was made September 1st, or credited on that date upon the books. As I have heretofore stated in my testimony, with reference to this account, it is not my duty to specifically charge or credit items from customers like the Fort Wayne Telephone Co., although I do exercise a general supervision over them. I am, as heretofore stated, assuming that the credits and charges have been made in the usual way in our accounts and that the statement shows a true account of these transactions.

Q. I perceive that by this contract the Fort Wayne Co. agrees that it will not violate or infringe your company's letters patent or patent rights, or any of them, nor contest the validity of same or of your company's title thereto. What, if any, patents did your company at that time hold, covering any part of the apparatus which by this contract it was to furnish to the Fort Wayne Company? A. Under date of this contract, April 21, 1896, the Western Telephone Construction Co., one of the parties to the contract, owned patents No. 521,461, granted to H. M. Fisk for a combined enunciator and spring jack, patented June 19th, 1894, under a grant from the United States Patent Office, and other patents.

Q. How many other patents and what is the number of
1335 them? A. I cannot at this moment tell what other patents. We have for some years been engaged in exploiting patents or devices covered by patents which we owned or controlled or had license to use; and I mentioned the one specifically heretofore stated.

Q. Can you tell us approximately the number of existing patents which your company owns or controls relating to telephonic apparatus of any kind?

Mr. BIRNEY: Objected to as immaterial.

A. I would find it difficult to give an approximate statement of the number of patents owned or controlled by this Company.

Q. Is it as many as a hundred? A. I don't think there are so many, but there might be.

Mr. WORTHINGTON: Counsel for defendant here offer in evidence the contract just produced by the witness between the Western Telephone Construction Co. and the Fort Wayne Telephone Co., being a contract dated April 21, 1896, and at the request of the witness, and by consent of counsel, a copy, in place of the original, is marked Exhibit Keelyn, Cross-Ex. No. 1, and is as follows:

1336 Western Telephone Construction Co.,
Principal Office: 250-254 South Clinton St., Chicago.

PROPOSAL.

For Apparatus for Fort Wayne, Ind., Telephone Exchange.

Chicago, Ill., April 21st, 1896.

To Fort Wayne Telephone Company (hereinafter called the Purchaser), of Fort Wayne, Ind.:

The Western Telephone Construction Company (hereinafter called the company) proposes to furnish a telephone exchange, as per the following specifications, for the sum hereinafter named:

The proposal is made subject to the following conditions, unless such conditions are hereinafter specifically changed or modified:

Section 1. It is understood and agreed that in accepting this proposal the purchaser covenants and agrees that purchaser will not violate or infringe the company's letters patent or patent rights or any of them, nor contest the validity of same, or of the company's title hereto. In case any suits are brought against the purchaser, alleging infringements of letters patent by the use of the hereinafter described apparatus, or any portion of the same, furnished by the company, the company agrees to manage and defend said suits at its own cost and expense, and to pay all sums that purchaser shall be adjudged or decreed to pay in such suits as damages, profits or costs of suits; provided that the infringement shown in such suit or suits does not result from the use of parts not manufactured and furnished by the company, and provided, also, that notice of the service of process in any such suit and of any action taken by the complainant therein be given in writing without delay by the purchaser to the company, and that the purchaser's agents and officers and employes shall give all needed information, assistance and authority in any such suit so far as possible.

Sec. 2. The company will not be held responsible for work done or apparatus furnished by others.

Sec. 3. The purchaser is to designate location of switchboard, lines and instruments before work is begun, and is to pay extra for any changes made and for any work performed or apparatus or material furnished in addition to that herein specified.

Sec. 4. The purchaser is to allow the work to proceed without interruption until finished, and to reimburse the company for any expense incurred by reason of delays in starting the exchange and completing the work that are not chargeable to the company.

Sec. 5. The purchaser is also to assist in the care and safekeeping of all apparatus and material delivered until the exchange is fully paid for, and to make good any loss to the company occasioned by careless or malicious destruction or removal of same by purchaser's employes.

1337 Sec. 6. Only apparatus acquired from the company will be used by the purchaser in the same circuit with that furnished hereunder.

Sec. 7. The exchange shall be considered as having been started, as affecting terms of payment, when the switchboard is first put into operation, and all expense connected with the actual operating of the plant shall be borne by the purchaser.

The exchange lines and instruments are to be located in accordance with the map hereto attached and marked Exhibit "A." Any changes in the location of poles, lines, instruments, central office or other apparatus, other than as shown therein, shall be paid for extra by the purchaser.

The company will do all work in a neat and workmanlike manner, and in accordance with the rules of the National Board of Fire Underwriters and the ordinances of the city.

Specifications for Exchange Apparatus.

Switchboard.—The purchaser is to furnish suitable premises in which to locate the switchboard and other apparatus.

Company will furnish 1,000 capacity or ten sections of 100 numbers each of its No. 1 improved metallic circuit switchboards, equipped with special clearing-out drops of anti-induction type. Set up in purchaser's premises.

Company will furnish a special set of its patent circuit changers for each board, each board being provided with multiple connections to its corresponding district upon the new Keelyn Central Office Distribution System. All to be provided with plugs and cords, automatic restoring drops, keyboards and operators' interconnections.

Magneto Bells.—Company will furnish 1,000 first-class mag-

neto generators and call bells of Western Giant type. If automatic hooks are desired, 10 cents each additional will be charged.

Telephone Receivers.—Company will furnish 1,000 first-class compound telephone receivers of bi-polar Western Giant type.

Telephone Transmitters.—Company will furnish 1,000 first-class telephone transmitters of Western Giant type.

Battery Boxes and Boards.—Company will furnish 1,000 first-class battery boxes and backboards in polished hardwood equipped with 2,000 cells of battery.

Telephone Cords.—Company will furnish 1,000 first-class receiver cords, flexible duplex type.

1338 Delivery of Apparatus.—The above-specified apparatus to be delivered at company's factory, Chicago, Ill., on or before June 15th, 1896, and to be installed for use at Fort Wayne, Ind., by purchaser.

Apparatus Miscellany.—Company will furnish 2,000 capacity lightning arrester and test board.

Company will furnish ten complete generator outfits for switchboards.

Company will furnish ten complete operator's outfits for switchboard.

Company will furnish one complete chief operator's outfit set in position.

Price, Terms, Etc.

Price.—Twenty thousand ($20,000.00) dollars (payable in Chicago funds).

Terms.—Ten per cent payable upon approval of this proposal, viz: $2,000;

Twenty-five per cent upon delivery of the telephones, viz: $5,000;

Twenty-five per cent upon delivery of the switchboards, viz: $5,000;

Twenty-five per cent within thirty days thereafter, viz: $5,000;

Fifteen per cent within thirty days thereafter, viz: $3,000.

The company further agrees that should any parts of said system be adjudicated to be an infringement of letters patent of others, it will change such apparatus so that it shall not continue to so infringe.

The title to the plant shall not pass from the company to the purchaser until it is fully paid for, and the purchaser agrees to execute and give to the company all legal documents necessary to effect this. In case of deferred payments by notes the title to the plant shall not pass from the company until such notes have matured and have been settled in full.

The foregoing proposal is subject to the approval of an executive officer of the Western Telephone Construction Company, and is not binding upon said company until so approved, is subject to change unless accepted by purchaser within fifteen days from date, and if so accepted is the agreement between said company and purchaser as it exists at the date of approval, and is is understood and agreed that all previous communications between said parties, either verbal or written, contrary to the provisions hereof, are hereby withdrawn and annulled, and no modification of this agreement shall be binding upon either of the parties unless such modification shall be in writing signed by both parties.

Apparatus to be first class in workmanship, material and electrical design. Additional apparatus needed by purchaser within one year from date hereof, of same class, to be
1339 furnished at same proportionate prices.

WESTERN TELEPHONE CONSTRUCTION COMPANY.

(Interlineations before signature, J. E. Keelyn. Approved April 22, 1896.)

WESTERN TELEPHONE CONSTRUCTION COMPANY.
By J. E. KEELYN, President.

ACCEPTANCE.

April 22, 1896.

Western Telephone Construction Company, Chicago, Illinois:

Your proposal as above is hereby accepted at the prices, terms, and subject to the conditions named therein.

THE FORT WAYNE TELEPHONE CO.,
By GEO. W. BEERS.

1340 By Mr. WORTHINGTON:

Q. What are the novelties in the switchboard in Newark, N. J., recently installed by you, to which you referred on your examination-in-chief?

Mr. BIRNEY: Objected to as already most elaborately covered by cross-examination.

The WITNESS: Before going into that, I would like to make a statement, if there is no objection, in reference to the Fort Wayne account.

By Mr. WORTHINGTON:

Q. You have a right to state anything which you think is necessary to explain your previous testimony, in order to make

a full showing of the facts, showing the transaction between your company and that company. A. I would like to explain that in the course of our business with the Fort Wayne Telephone Company, naturally some errors in shipments arose, and some exchanges of materials. In the ordinary commercial run of things it took some time to adjust the relative difference in values of these things; and in determining allowances of credit charges for purchases undefined at the time of purchase, or apparatus charged for which was shipped there and might not have been just what was wanted and had been returned, the payment or credits therefor were deferred to such times as adjustments could be had, reasonably and amicably between my company and the Fort Wayne Telephone Co. This may somewhat explain the appearance of payments under that account, and I mention it so that it may be understood that our relations with the Fort Wayne Telephone Co. were sat-
1341 isfactory upon the whole, and the payments, while in some instances they have been deferred for reasons of convenience to either or both, were so made, not because of any suits or action in that nature brought by us or others of whom we had any knowledge, to enforce any payments for the liquidation of any accounts of the Fort Wayne Telephone Company.

In answer to your question, one of the novelties in the Newark switchboards is a self-restoring drop or indicator. This indicator is operated by a subscriber, to inform the central office operator that he has called for connection. In switchboards as ordinarily used, for instance such switchboards as are in use in the city of Washington, this indicator is placed in a somewhat different position from those in Newark, and is used somewhat for the same purpose, of advising the central office operator that the subscriber has called for connection. The Fisk patent, mentioned in my testimony heretofore, in one of its claims covers a feature of automatically, so to speak, restoring this drop to its normal position by the operation of inserting the plug into the subscriber's jack. When the operator in the usual manner places the plug in the jack, that is to say, in the ordinary board, and in such switchboards as are used in the city of Washington—

Q. Mr. Keelyn, I do not want to interfere with your saying anything which you think is competent here, but I would like to call your attention to the fact that you are departing entirely from the question, which is simply what were the
1342 novelties introduced into the Newark switchboard. A. I understand the question to be what are the peculiar novelties in the switchboards at Newark, N. J.

Q. You have said one of them is a self-restoring drop. A. And in order to show a peculiar novelty, I have deemed it ne-

cessary or proper to distinguish what it was noved in and how it differed from the ordinary. In ordinary switchboards the drop or indicator at the central office and the operation of plugging into a jack constitutes two distinct operations on the part of the operator. The time required in making connections by an operator between subscribers is measured by the number of movements required and the respctive time required by each of these movements. Some of these movements require three or four or five times, or even more than five times as much time as is required in others. Ordinarily the time required by the operator in the one act of restoring the indicator or subscriber's drop requires as much time and effort as any other single movement in the operator's evolutions in connecting two subscribers. It is an operation also which is required in every call upon the telephone exchange by a subscriber when he desires a conneetion. The operation of inserting the plug into the subscriber's jack is also an operation required by the operator in every connection between subscribers. By a novel arrangement—

(At this point Mr. Charles Darwin Haskins entered the room, and his presence in the room was objected to by the wit-
1343 ness.)

A. (Continuing) Of the drop and jack with relation to each other in our switchboards such as are in use in Newark, N. J., the one operation of inserting the plug does the two things mentioned, namely, connecting the plug with the subscriber's jack and restoring the drop; and thereby two distinct movements, occupying an operator's time, are made in one.

Q. That is one novelty in the Newark board. What are the others? I only want such a description of them as will enable us to know in a general way what they are.

Mr. BIRNEY: Objected to as immaterial.

A. The Newark switchboards are based upon modern engineering of first-class telephone experts. They involve a great number of novelties over those ordinarily used, although embodying well-tried devices in our practice. The enumeration of these various novelties might occupy my time in responding to questions upon them for several days, if not weeks, if the details were gone into at more length; and it might be said also that I would be placed at great disadvantage in responding offhand to details of construction in a matter of such extensive work as the switchboards in the Newark telephone exchange. I might readily err upon some special detail if I assumed that it had been put in upon the plant approved by me, and had been changed by the engineer in charge of the work of installation, but probably not upon such general proposition of a nov-

elty necessarily involved, as that mentioned of the self-restoring drop feature, mentioned heretofore.

1344 Q. I wish you would give us one more novelty in the Newark board, and select the one which you consider as important as any other. A. It is difficult for me to select any particular novelties in switchboards like the Newark switchboard, designed upon a comprehensive system, as it is designed upon.

Q. You said in your examination-in-chief that some things were omitted from the Newark switchboards which had been in use in boards formerly constructed by your company, as I understood you. What are those things which are omitted in the Newark boards? A. I cannot recollect at this time just what was omitted. I have a fair recollection that a number of things were omitted, but just what they are I cannot call to mind at this moment.

Q. Has your company, since the Newark switchboard was installed, installed a switchboard in any other city with a capacity of one thousand or more subscribers? A. We have furnished equipment for a switchboard involving more than one thousand subscribers since the installation of the Newark switchboards.

Q. How many? A. Several. I cannot give the exact number.

Q. Enumerate the cities, so far as you can. A. We furnished equipment to increase the Wilmington, Delaware, system to over 1,000 subscribers' capacity, and to increase the Norfolk, Virginia, system to more than 1,000 subscribers' capacity. We have probably furnished equipment to the Fort Wayne system to increase it beyond the number men-

1345 tioned. I trust that these will answer the question.

Q. They will, if they are all you remember; otherwise not. A. I do not recall at this moment any others.

Q. Do the three equipments which you have last mentioned correspond to the Newark switchboard? A. In some respects, particularly upon the one specific novelty I mentioned, of the self-restoring drop.

Q. Is what you call your multiple transfer system used in connection with the Newark switchboard? A. Yes, sir.

Q. And the Wilmington switchboard? A. Yes, sir.

Q. And the Norfolk switchboard? A. Not in the same relation as at Newark nor at Fort Wayne.

Q. Did your company furnish the original switchboard for the Norfolk Company? A. No, sir.

Q. When did you first furnish any equipment for that switchboard? A. About two years ago; possibly three years.

Q. Did that equipment contain your multiple transfer system? A. Not the same as at Newark, N. J.

Q. What is the difference? A. They differ considerably in many details.

Q. Was the switchboard equipment which you furnished for the Norfolk exchange two or three years ago abandoned
1346 by that company? A. We shipped to them upon their order, within a month, 300 additional drops capacity to be added to the same switchboards first furnished by us to them. It is not unusual in telephone exchanges, and rather the rule in all telephone exchanges that are growing, to revise, add to or change somewhat the details of a switchboard to suit the improvements; and there may have been changes in the Norfolk system, but I do not believe that the switchboards furnished by us first to the Norfolk exchange have in the main been abandoned. I believe that the great body of the switchboards and the main portions thereof are still in use, although, as stated, there may have been some changes in the devices first furnished.

Q. Did the equipment of that Norfolk switchboard which you first furnished provide for self-restoring drops? A. Yes, sir.

Q. And that was about how long ago? A. Two or three years ago.

Q. Has there been any radical change in the equipment of that board as first furnished by you several years ago, made because originally furnished it was found to be entirely unsatisfactory in operation? A. No, sir. I answer this question, no, sir, taken as a whole.

Q. Does the question contain any suggestion of what has happened? If so, what is it?

Mr. BIRNEY: Objected to as calling upon the witness to interpret counsel's question.

1347 A. I have stated before that there are changes made in switchboards as a rule when changes are desired, for the purposes of progress or otherwise; that mechanical devices or electrical devices are subject to the same difficulties in practice that may be found in other things, to some extent; and there might be changes in the Norfolk switchboards to make them more suitable for the purposes of the operation there, and undoubtedly some changes were made, but no changes that I am aware of that would lead me to believe that they were entirely unsatisfactory as first furnished.

Q. Have any changes been made there because the board has been found unsatisfactory in its operation, omitting the word "entirely?" A. There were some changes made in the Norfolk switchboards which I understand were by reason of the unsatisfactory working of some of the devices, which devices were

replaced with other devices, and which we are now informed are giving satisfaction where the others did not.

Q. When was that change made? A. Recently.

Q. What was the change? A. Some of the clearing out drops, so-called, were changed and replaced by those which seemed to better satisfy the Norfolk people.

Q. Were not all of the clearing out drops changed, or the apparatus by which they were operated? No, sir.

1348 Q. What proportion of them was changed? A. I do not recall at this moment.

Q. Is that change still going on, or has it been concluded? A. I have stated that there are usually changes going on in switchboards.

Q. I am talking about this particular change in clearing out drops of the Norfolk board? A. There might be.

Q. Do you not know that they are now completing those changes as to all the drops? A. That there are or have been recently some changes, I believe. What the condition of these changes is at this moment, I am not positive.

Q. Was not the difficulty with the Norfolk board as first furnished by you that when a subscriber had finished one conversation and wanted to get another subscriber, there were no means by which he could communicate with the central office immediately the fact that the first conversation was finished; in other words, that a subscriber could not make two calls in quick succession with certainty? A. In the boards first furnished at Norfolk there were means applied for obtaining the result indicated. However, through the carelessness of one operator these means might not have been fully employed to give the result indicated. Upon information, changes were made to bring about the result indicated. This statement is made upon my belief, more than upon my knowledge

1349 positively. I would add, for the purposes of explanation of that, that some of the devices complained of and changed are duplicates of devices in operation furnished by this company in like manner elsewhere with full satisfaction, and I believe that at Norfolk there was some personal preference with reference to devices which involved the change. The devices last furnished were such as were gotten up and designed and manufactured later than the time when the Norfolk switchboards were first being made, and might fairly be stated to be improvements upon those which were first furnished to the Norfolk board. It was but natural that the Norfolk people should want the improved devices, if they appeared to them to be better.

Q. At whose expense were these recent changes of the Norfolk board made? A. They were made at our expense; and I

might qualify or explain the reason therefor. I believe we are at present making some devices or changes in switchboards, which recollection is suggested by the question. Our business relations with the Norfolk Company are such that at their request, as a favor, and in connection with an additional order and future business promised and compensation, we are or have been making some additional changes for the Norfolk switchboard in line with the improvements mentioned or the changes heretofore referred to. It might be said that we are making these changes at our expense. It is our rule to pursue a gratuitous policy upon such things as may appear to
1350 us to be for our best interests in extending our trade relations and friendship with our customers; and these recent devices being replaced or having been replaced was in line with this policy. We have frequently given a telephone to a customer as a gift, to secure his favorable impression of that instrument, where we had prospect of improving our trade or business, and in some cases where it was disputed by the Bell people that we could accomplish certain results, we have volunteered our service freely or our devices, so that we might show that these results could be accomplished by us.

Q. Was the request of the Norfolk Company which you have described "as a favor and in connection with an additional order and future business promise" in writing? A. It may have been. I started to find it. I will get the letter if I can.

Q. Was your first equipment of theNorfolk exchange under a written contract? A. I believe it was.

Q. Please produce the contract and the request just referred to. A. I refuse to deliver the contract or the request for reasons which I have heretofore given. I submitted the contract between this company and the Ft. Wayne Telegraph Company, in order to avoid the assumption or error that we were reluctant about giving information reasonably required for the purposes of this examination. I cannot allow myself to be used as a tool for furnishing the agreements between this
1351 company and its customers. I had intended before this demand to furnish the letter referred to, and had made a request to have it looked for, and would have furnished it if this demand had not been made; but I see in it a disposition to pry into our private contracts and agreements further than I believe I should be asked to acquiesce in. I therefore refuse now to furnish the contract and letter referred to.

Mr. WORTHINGTON: This objection and statement by the witness requires counsel for the defendant to make the following statement: This witness in his direct examination was called upon to testify, and did testify, that the company of which he is president has furnished telephone equipment in a

large number of cities in the United States, and he mentioned specifically, among other cities, the city of Norfolk. His direct examination also tended to show that the telephone service which is rendered to subscribers in various cities by the apparatus furnished by this company has been satisfactory and sufficient for all reasonable purposes. Our cross-examination is directed towards showing that as a matter of fact no switchboard or telephone equipment furnished by this company to any city in this country having an equipment of more than 1,000 subscribers has been satisfactory. If facts in detail are made known to the court, this will be established out of the mouth of the witness, and the papers which we are calling upon him to produce, and which we expect to call upon him to produce before we get through with him; and I now give
1352 notice that if the witness persists in refusing to give the information sought for, and insists that his verbal statements shall take place which the writings themselves would furnish the best evidence of, we shall move the court to strike out his whole testimony on that ground.

Further, as to these specific papers, in reference to the Norfolk transactions of the witness' company, he has stated that the recent changes which he has described in the switchboard there were made by this company voluntarily. We call for the contract and for the written request referred to, for the purpose of showing that as a matter of fact those changes were made because this company was required to make them in carrying out its agreement with the Norfolk Company.

(At this point the witness asked leave to be excused for a short time, and retired from the room. After an absence of about ten minutes the witness returned.)

By Mr. WORTHINGTON:

Q. Have you produced the contract and written request referred to? A. No, sir.

Q. Will you produce them? A. What written request.

Q. You stated in a recent answer that certain things were done upon a request from the Norfolk Company. I asked you whether that request was in writing, and I understood you to say you thought it was. A. We have had correspondence with the Norfolk Company dating back from the date of our contract or earlier. There is a mass of letters, apparently,
1353 judging from a moment's examination during my absence, that would require a considerable time to obtain the letters mentioned by me as showing the request. I was unable to find the letter I had in mind on this examination. Some of the letters involved points in connection with switchboards at Norfolk, I believe—

Mr. WORTHINGTON: I object to the witness stating the contents of letters which are not produced. The letters themselves are the best and the only proper evidence.

The WITNESS: I cannot at this time produce the letters referred to.

Q. Will you produce your ledger containing the accounts between the Western Telephone Construction Company, of which you are president, and the Richmond Telephone Company, referred to in your examination in chief?

Mr. BIRNEY: Counsel for complainants objects on the ground that the question of accounts between this company and the Richmond Company must be and is wholly immaterial to the inquiry now being conducted, and as utterly incompetent for any purpose.

By Mr. WORTHINGTON:

Q. What is the name of the company which you furnished with telephonic apparatus, as stated in your examination in chief? A. I would like to know where the statement was.

Q. You were asked to enumerate the cities which you had equipped with telephonic exchanges in whole or in part. You mentioned a number of cities, including Norfolk and
1354 Richmond. A. Did you ask the name of the company at Richmond, Virginia?

Q. Yes; did you refer to Richmond, Virginia, when giving the list of cities or to Richmond in some other State? A. Probably Richmond, Virginia.

Q. What is the name of that company? A. The Richmond Telephone Company.

Q. How recently has your company furnished telephonic apparatus to that company? A. I refuse to answer.

Q. Why? A. Because it discloses private transactions between my company and the Richmond Telephone Company.

Q. Has not the Richmond Company abandoned entirely the use of any telephonic apparatus furnished by this company, on the ground that your apparatus gives unsatisfactory service? A. I believe we have an order to-day from the Richmond Telephone Company for telephonic apparatus.

Q. You are willing to answer my question, it seems. Why this sudden change? A. I do not see any sudden change in it.

Q. I again ask you how recently you have furnished any telephone apparatus to that Richmond Company? A. I have answered that question.

Q. You have refused to answer that question. A. I
1355 have answered by refusing to answer.

Mr. WORTHINGTON: I again give notice that if the witness refuses to answer this question we shall move to strike out the entire testimony in relation to the equipment of telephonic exchanges in other cities by this company, on the ground that the information called for by the cross-examination is necessary to give the court a proper understanding of the efficiency of the telephonic apparatus furnished by the Western Telephone Construction Company, and on the further ground that the defendant is entitled, as a matter of right, to full information upon the points as to which the witness has given such information as was desired by the complainants' counsel.

Mr. BIRNEY: Since the question asked has no relation whatever to any question asked by counsel for complainants, complainants' counsel declines to interfere with the witness in his answers.

By Mr. WORTHINGTON:

Q. How recently has the Western Telephone Construction Company furnished any telephonic apparatus to any exchange in Johnstown, Pa.? A. I don't recall.

Q. Approximately. A. Within a year.

Q. Why do you answer as to Johnstown and refuse to answer as to Richmond? A. It may have been a personal notion that in one case it was proper to respond and in the other that it was improper.

1356 Q. What is the difference in the two cases which makes it proper to answer in the case of Johnstown and to refuse to answer in the case of Richmond? A. I chose to answer in the case of Johnstown, as I answered it, and I chose to answer it in the other case as I answered it.

Q. How recently has your company furnished any telephonic apparatus to any exchange in Chester, Pa.? A. I refuse to answer.

Q. How recently has your company furnished any telephonic apparatus to the exchange in Newark, Ohio? A. I refuse to answer.

Q. In Chillicothe, Ohio? A. I refuse to answer.

Q. In La Crosse, Wisconsin?

Mr. BIRNEY: Counsel for complainants requests the witness to answer if he can from recollection these questions.

Mr. WORTHINGTON: I ask counsel for complainants why he does interfere now when a few moments ago he refused to interfere.

Mr. BIRNEY: To which there is no response.

A. I wish to say that, my attorney not being present, I am lacking of such advice as I would usually take in responding

to these matters. I wish to give such information as I can reasonably be expected to give, and am not answering in the manner indicated for the purpose of hiding things which would seem to me material; but in the absence of my counsel,

1357 I am endeavoring to avoid so far as possible the disclosure of the private transactions between my company and its customers, unless they may be necessary to this examination and proper for me to give. I am not a lawyer and am unacquainted with the processes of this examination from a legal point of view, and uncertain at times where my examination might properly allow me to refuse to answer a question other than as I have answered. In the case of the Richmond Telephone Company, I cannot recollect the time of the last shipment; and, deeming it improper to disclose such shipment without knowing its nature at the moment, and believing that it would disclose private transactions between this company and its customers, the Richmond Telephone Company, I refuse to answer. In the case of the Johnstown Company, for instance, it clearly appeared to me that I did not recollect, and I promptly answered in that manner. As to my refusal to answer in other cases, I might add that I am not at this moment informed just when the last shipments were made.

Q. Is there any difference in your informing yourself, in a few minutes, by the records of your office here, so as to give an answer to the questions which you have refused to answer with regard to Richmond, Chester, Newark, Ohio, and Chillicothe? A. It would take more than a few minutes to acquaint myself with the facts sufficiently to answer intelligently.

Q. Will you take the time, whatever it may be, and give us the information?

1358 Mr. BIRNEY: Counsel for complainants here states to the witness that, in his opinion, he is under no obligation to make search for counsel for defendant.

A. It would be a difficult task for me to make the search, and I therefore decline to make it at this time.

Q. Are the accounts of your company with the other companies referred to, as far as you know, kept in the same ledger and in the same manner as the account with the companies at Fort Wayne? A. They might have been. I believe some of them are. I am not certain whether all of them are or not.

Q. Can you ascertain whether they are by examining the ledgers which were produced here for our inspection the other day in regard to the Fort Wayne companies? A. No; I refuse to furnish our books for the purpose asked by the counsel at this time.

Q. I do not ask you now to produce the books, but either to look at those accounts yourself or have your bookkeeper look and give us the information. A. I must refuse to make the examinations at this time.

Q. Who is your counsel to whom you have referred? A. Judge Holmes and Mr. Josiah McRoberts.

Q. Where are their offices? A. In the city of Chicago.

Q. Have you seen either of them since your examination began? A. No, sir.

Q. Did you take the advice of counsel before you took the stand as a witness for the complaints and testified to the
1359 fact that your company had furnished telephone apparatus to exchanges in the cities of which we have been speaking? A. I did not take the advice of my counsel previous to taking the stand.

Q. Did you know when you gave that testimony that you would be subject to cross-examination in regard to it? A. I might have assumed as much. I wish to add that Judge Holmes and Mr. Josiah McRoberts, I have learned since this examination was begun, are absent from the city. One of them I believe to be in New York, and the other one to be in Washington at this time. I have sought to have one of them give me this advice, but find them without my reach.

Q. Did you not when you were under examination the other day withdraw from the room for the purpose of consultation with your counsel? A. Yes, sir.

Q. Did you have any consultation with any counsel in reference to this matter then? A. I learned upon—

Q. Please answer the question. A. I don't recollect at this moment. I recall going out of the room for the purpose of learning whether Mr. McRoberts was in the office. He has a desk in our office, and I was informed that he was out of the city. I do not recall at that time having taken any counsel, although I may have talked to our bookkeeper about the books, or with some other employee or person connected with the company.

1360 Q. You have not yet answered that part of my last question which inquires whether when you retired the other day you did not in fact consult other counsel. A. I do not recollect at this time sufficiently to answer that question.

Q. How long ago was that? A. I would like to know that myself. I have passed out of this room several times. At the time I passed out of the room to inquire for Mr. McRoberts my counsel, and endeavored to have him present, I do not recollect having taken any advice or counsel with reference to this case, although I may have asked our bookkeeper or my private secretary if some letters or papers which I thought might be needed were found or could be gotten at.

Q. Have you not consulted with counsel with reference to this case since your examination as a witness began? You will understand, of course, by this question, that I refer to legal counsel and nothing else? A. I have asked Mr. Birney, counsel for the complainants in this room, one or two questions, possibly more, during this examination. I do not recall what the questions were.

Mr. WILSON: We are not inquiring of the witness with reference to any conversations he may have had with Mr. Birney.

The WITNESS: Then I can more clearly answer that I have taken no counsel or legal advice with reference to my testimony in this case.

By Mr. WORTHINGTON:

1361 Q. How long has it been since the company of which you are president furnished any telephonic apparatus or material for any exchange in the city of Charleston, South Carolina? A. I don't recollect.

Q. Approximately. A. Within a year; possibly within a month.

Q. Why do you answer as to Charleston, when you refused to answer as to other cities? A. A matter of notion, possibly, more than anything else.

Q. When did the Western Telephone Construction Company last furnish any telephone apparatus or material to any exchange at Paterson, New Jersey? A. Within two months, I believe.

Q. Will these dates as to Charleston and Paterson appear upon your ledger account with the companies there? A. I believe so.

Q. Will you please look at them, or have inquiry made and give us the dates; or again produce the books and allow us to look at the items for ourselves, whichever you prefer. A. I don't feel at liberty to produce the books or the dates of shipments.

Q. Did your company at any time install a telephonic plant in the city of Lansing, Michigan? A. I believe it did.

Q. When? A. Several years ago.

1362 Q. About how many? A. Three or four.

Q. Did you furnish a switchboard and its appurtenances to that exchange? A. Yes.

Q. And also the equipment for subscribers' stations to be connected with the exchange? A. The telephones were, I believe, for that purpose.

Q. Did you furnish the apparatus for connecting the exchange with the subscribers' stations, or any of it? A. I believe so.

Q. What has become of that exchange plant, so far as you know? A. You mean the apparatus?

Q. Yes; I want to know if it is still in use, or whether it has been since abandoned, if you know? A. I understand and am informed that the apparatus is still in use, mostly.

Q. Has there been any material change in it since you furnished it? A. I understand that there has been considerable change in the apparatus at Lansing.

Q. Has your company made that change? A. We have made some of the changes of which I have heard. We are furnishing them apparatus at present, I believe. We have had their orders for apparatus recently.

Q. How recently? A. I believe within a month or
1363 two.

Q. Would that appear upon your ledger? A. I believe it would.

Q. Will you allow us to see that? A. No, sir.

Q. Will you look at it yourself and give us the date. A. No, sir.

Q. You have said that some of the changes that were made in the apparatus at Lansing were made by your company. Were other changes made by some other person or corporation? A. I have been informed, and believe the sources of information to be reliable, that the people operating or owning the Lansing system, desiring to increase the size of the plant, considered it advisable to put in a larger switchboard, that is, a 500 or 600 capacity equipment, in place of a 400 capacity equipment, which we first furnished to them; that in the course of negotiations they made a trade resulting in the adoption of another switchboard and in the transfer of the first furnished 400 capacity switchboard to the city of Decatur, Illinois, where it is now in use, giving, I am informed, satisfacton.

Q. Did your company furnish and equip the switchboard at Lansing to take the place of the old one? A. I believe not all of it.

Q. What part of it? A. I do not recollect.

Q. What person or company furnished the rest of it? A. I do not know.

Q. I understand that all you have been telling us of
1364 the Lansing exchange is upon information from somebody else. Is that correct, or have you some personal knowledge in the matter? A. I may have personal knowledge of it, but mainly upon the sources of information generally relied upon by us.

Q. What are those sources of information in that particular case? A. Our agents, traveling men, salesmen and other sources that I cannot call to mind at this moment.

Q. Did you learn from the same sources of information what person or corporation furnished the switchboard that took the place of this at Lansing? A. I do not recall, but I believe the American Electric Telephone Company furnished the switchboards which were furnished in place of them, if I recollect the information. I do not know this.

Q. Where is the main office of that company? A. In the city of Chicago.

Q. Where in Chicago? A. On information, I believe it to be upon Canal street, near Van Buren.

Q. What person or corporation equipped for use at Decatur, Illinois, the switchboards which you say were transferred from Lansing to Decatur? A. I do not know.

Q. Do you know what was the nature of the equipment at Decatur? A. No, sir; not any farther than I have indi-
1365 cated. I am informed that the switchboards we first furnished to Lansing were transferred to Decatur, Illinois, and are now in use there, satisfactorily to the people. I would say, in explanation of this, that in the telephone business it so happens that at times in increasing or changing the system, a local company, like the Lansing Telephone Company, for instance, might purchase apparatus from different telephone manufacturers. There are a great number of manufacturers of telephone apparatus in competition with each other for that kind of business; and it happens that occasionally we may take out the switchboard of a competitor and put ours in place of the same, in increasing it, or for some other reason; or that some other of our competitors may take our apparatus out and put theirs in place of it. This appears to be somewhat the case at Lansing.

Q. Did the company of which you are president at any time install a telephone plant at Kalamazoo, Michigan? A. We furnished apparatus for a plant at Kalamazoo, Michigan.

Q. What apparatus, in a general way? A. The type of apparatus we were making three or four years ago.

Q. Did you put in a switchboard there? A. We furnished a switchboard to the Kalamazoo plant.

Q. Was it the naked switchboard or the switchboard and its appurtenances, ready for use? A. I think the switchboards were furnished, delivered either at our factory or f. o. b.
1366 in Chicago.

Q. You have not answered my question with reference to whether it was the naked board or board with the equipments for use. A. You asked me if it was equipped.

Q. I want to know to what extent it was equipped, if it was not the naked board. A. We undoubtedly furnished nearly all the apparatus requisite to put the switchboards in operation

for public telephone exchange purposes; but my recollection is that the Kalamazoo Company, purchasing it itself, furnished some of the things necessary to entirely complete it for such operations.

Q. What was the capacity of that Kalamazoo switchboard? A. My recollection is that it was 300 capacity.

Q. When was it furnished? A. I should say about three years ago.

Q. Did you furnish to that Kalamazoo Company anything except the switchboard and its appurtenances as you have described? A. I believe we furnished the telephones for the subscribers' stations.

Q. Do you know what has become of that switchboard and its appurtenances? A. I believe that the switchboards which we furnished to Kalamazoo, Michigan, were purchased by the company at Decatur, Illinois, and added to the 400 capacity switchboards the Decatur Company also purchased from Lansing, Michigan; and a part if not all of the 300 capacity
1367 switchboards which we had furnished Kalamazoo were joined together with the 400 capacity switchboards from Lansing, Michigan, as a central office system for a 700 capacity central office system at Decatur, Illinois, and are now in satisfactory operation there, giving public telephone exchange service.

Q. Did another switchboard take the place of that switchboard at Kalamazoo? A. I am told so.

Q. What company furnished that switchboard? A. I do not know.

Q. You speak of the combined switchboards at Decatur being in satisfactory use. Do you know with what system they are equipped or whether any changes have been made in their operation since you installed them at Lansing and Kalamazoo, respectively? A. I do not know except as would be inferred from my previous answers.

Q. Did your company at any time furnish telephonic exchange equipment to a company at Keokuk, Iowa? A. We furnished switchboards to a Mr. Hubbinger at Keokuk, Iowa.

Q. When was that? A. Within two or three years.

Q. What was the capacity of that board? A. Two or three hundred capacity.

Q. Did you furnish anything else besides the board? A. Yes, sir: we furnished telephones for subscribers' stations.

1368 Q. Did you furnish the equipment for the board, the part of it which is appurtenant thereto and used in the central office? A. I believe so.

Q. Did you furnish also at Keokuk the wires and other apparatus for connecting the exchange with subscribers' stations? A. I don't recollect. I believe not.

Q. What became of that switchboard that you furnished to Mr. Hubbinger at Keokuk? A. I am not certain, but I believe that he still has it, although I am informed that he changed it in some respects.

Q. What was the contract price for what your company furnished this gentleman at Keokuk?

Mr. BIRNEY: Objected to as entirely immaterial and having no reference to the examination in chief.

A. I do not recall.

Q. Approximately? A. Between $10 and $15 per telephone, and between $3 and $5 per drop for the switchboard.

Q. That would make the total about how much? A. I have forgotten.

Q. How many telephones did you furnish? A. I have forgotten.

Q. As many as there were drops to the switchboard? A. I am not sure of that. Probably not. It is usual to furnish a little more switchboard capacity than telephone capacity.

1369 Q. Did you furnish that apparatus under a written contract? A. I believe so.

Q. Is that on file here in your office? A. I believe it is.

Q. Will you please look at it and tell us what was the contract price?

Mr. BIRNEY: Objected to by counsel for complainants on the grounds heretofore given.

A. No.

Q. Why?. A. The contract appears to me to be a matter of private business of this company with its customers and I do not think it is proper to expose its terms, as might be involved in its production.

Q. Is that the reason you refuse to look at it yourself and give us simply the contract price? A. Do you ask for simply the contract price?

Q. I asked you that in the first instance. A. It may require a long search. If counsel expect the examination to continue after lunch, as I do not wish to interrupt the questions at this time, I will endeavor to make some search for it and respond after recess to this request.

Q. Very well. We will pass this particular matter until after the noon recess.

At this point a recess was taken from 12.40 p. m. until 1.30 p. m.

1370 After recess.

Cross-examination of James E. Keelyn resumed.

The WITNESS: I have searched for the contract to show the price of the telephones and switchboards at Keokuk, and have been unable to find them.

By Mr. WORTHINGTON:

Q. Did not Mr. Hubbinger refuse to pay that contract price on the ground that the apparatus and materials which you furnished him were unsatisfactory?

Mr. BIRNEY: I object to the question as not proper cross-examination.

A. I have forgotten just what the reasons were for the refusal to pay promptly the amounts charged him for apparatus, but I recollect that he paid the account.

Q. In full? A. I believe so. It may be that in an action that we had there were some allowances, but my recollection is that he paid the account in full, after first having some dispute.

Q. Is it not a fact that after you brought your suit on the contract your company compromised the claim for $1,500? A. It is my impression at this moment that there was some compromise in the amount of the claim. I rather think this compromise was to effect a speedy settlement, and not for any reason that the apparatus furnished by us failed to meet the conditions under the contract.

1371 Q. Did not Mr. Hubbinger resist your claim on the ground that your apparatus would not give satisfactory or efficient service? A. I believe so.

Q. Will the account with Mr. Hubbinger upon your ledger show what he was to pay and how much, in fact, he did pay? A. It probably would show what he did pay, and it probably would show what we charged him.

Q. Have you any objection to looking at that account or producing it, so that we may ascertain what the facts are as to this? A. Yes, sir.

Q. What is the objection? A. I do not care to furnish our private business for the detailed inspection of this commission.

Q. When you brought suit, did you not file in court there as a public document a statement as to this very ledger account that we are now asking for? A. We probably did, at least, probably all that account which was due us; maybe not all the whole account. The account, I think, would naturally have run as those accounts usually do, through a process of charges and credits from time to time.

Q. When was it you went to Washington, D. C., for the pur-

pose of making the estimate concerning which you have testified in your examination in chief? A. I have been there several times, but I think particularly last year and the
1372 year before. I do not recall the time. I frequently visited Washington, and it was upon one or two or more of these visits that I had occasion to investigate the matter of cost of installation of a telephone system.

Q. How long were you there when you made your first visit for the purpose of obtaining data for this estimate? A. I have forgotten.

Q. About how long? A. It may have been several days. Just how many days I do not recall.

Q. How much time did you spend in Washington when you went there the second time on this business? A. I have forgotten how many days.

Q. About how much time did you spend altogether in Washington making the investigations necessary to enable you to make your estimate? A. I believe I have examined into the question of a telephone exchange system for Washington, as to its probable cost, either in the city of Washington or elsewhere, including my calculations here in the office, and the reports of experts whom I have employed for the purpose, approximately a hundred times—a good many times, if not a hundred times.

Q. My question is how much time did you personally spend in Washington conducting inquiries or making an investigation to enable you to make your estimate? A. I did not confine my time in making the investigation entirely to my visits in Washington, but the amount of time I have spent there on the
1373 subject particularly I am unable to state now. I did not keep track of it.

Q. Was it more in all than a few days? A. I would not undertake to say.

Q. Where did you go to make your inquiries—what investigation did you make in Washington personally? A. I inquired into the character of the pavements and streets, somewhat into the routes which the present Telephone Company takes, and those which would be advisable to take with a new system, as to where the approximate locations for one or more central offices would be, as to the cost of taking up and laying down these pavements and conduits, relative costs of shipments and transshipments of materials to be purchased elsewhere for use there, and generally such things as appeared to me to be necessary upon which to base an estimate, as we ordinarily would base one upon information.

Q. Did you make this investigation and estimate at the request of any other person, or simply upon your own motion?

A. I think some of the estimates were in connection with requests from others, and some of them were made upon my own motion as contemplating the ultimate establishment of a telephone system in Washington, which we might want to be prepared to furnish an intelligent estimate upon.

Q. Who are the persons referred to? A. I do not care to furnish the names of parties we were figuring upon in connection with this matter.

1374 Q. Why? A. Because I do not think it is good business to furnish that private information in reference to our private business.

Q. You are giving your testimony with reference to the interests of your business, but not with reference to what it may be important for the court to know. Am I correct? A. I am exercising such judgment as I have in the matter.

Q. Was the estimate which you made in the nature of a rough calculation or guess, or did you figure out in detail the cost of each of the items which would constitute the proposed exchange in Washington? A. I made calculations somewhat in detail of costs of the system, and recapitulated those in the whole.

Q. Have you preserved that recapitulation or a copy of it? A. I probably have somewhere portions of it, if not all.

Q. Have you preserved the detailed calculations upon which the final recapitulations were made? A. I have forgotten.

Q. Do you object to inquiring here of the proper office whether these papers or any other are preserved and readily accessible? A. Yes, sir.

Q. Why? A. Because I would not furnish private information upon which we base estimates or upon which we
1375 make calculations as to the cost of a system in detail.

Q. You have testified here for the complainants that you made such an estimate and that it amounted to about $450,000. We now, as counsel for the defendant, and for the information of the court, and for the protection of our client, ask you to show to the court how that result was reached, so that the court may take that and other evidence upon the same subject into consideration in deciding what weight, if any, is to be attached to your estimate. Do you refuse to give these items? A. My recollection is that in my testimony upon this subject I did not say about $450,000, but did say that it was less than $450,000. I do not wish to make a search for the detailed statements, as I am convinced that even if I had them before me I would refuse to furnish these detailed statements at this time. We may be called upon to figure in competition upon the cost of such a telephone plant as we contemplated at the time of making these estimates, and I do not wish to expose to competition or to the resources of competition what our calculations were.

Q. Did you submit that estimate when it was made, either in gross or in detail, to any other person or corporation? A. My recollection is that I submitted to others that the detailed cost of such telephone system would be less than the amount named.

Q. Did you submit any written statement in regard to
1376 that? A. I have forgotten. It seems to me that we may have. My recollection is that some negotiations I have in mind were verbally carried on.

Q. But whether the submission was in writing or orally, to whom was it made? A. I do not at this moment recall what particular party it was submitted to. I believe the estimates were made in the interest of the Columbia Telephone Company of Washington.

Q. Can you give me the name of any officer of that company? A. My impression is that the company was not entirely incorporated; that it applied to Congress for a franchise and my own name was included among those of Mr. Daniel, Mr. Lambert, Mr. John A. Baker, Mr. Langhorn, Mr. Butterworth, now deceased, and others.

Q. Did you at that time reach any more definite estimate or communicate any more definite result to this company or proposed company, or those who were interested in it, than simply that the cost would be less than $450,000, without telling them what it would be approximately? A. I have forgotten. We talked about the matter quite a number of times, and what those conversations were I could not recall at this moment.

Q. Did you have any correspondence with Mr. Butterworth on the subject of this estimate? A. I have forgotten.

Q. Did you have any correspondence with any of the other gentlemen you have named on that subject? A. I do
1377 not recall, but it seems to me that there was some.

Q. With whom? A. I have forgotten now with which one of them.

Q. I now request you to ascertain whether you can find the recapitulation to which you have referred, of your estimate as to the cost of the Washington telephone plant. A. I will be unable to find this without considerable search and trouble.

Q. You have stated on your direct examination that the estimate in question was made upon the basis of a telephone exchange with 3,000 subscribers, with an excess cable capacity of 1,000 and an excess conduit capacity of 1,000 more; with first-class modern equipment and starting from a central point, approximately 1,000 feet from the corner of F and 14th streets in Washington. I will now ask you to state from your recollection, refreshed by any proper memoranda or papers, if necessary, the details of that estimate? A. It would be almost an impossibility for me to call to mind the estimates for the dif-

ferent work in detail, even approximately, upon each thing, except I might say as to the cost of cables; for instance, my recollection is that I estimated the cost of 50-pair cable to be about 20 cents per lineal foot. I estimated the cost of our switchboards and telephones at such prices as we would usually charge for such equipment. I have frequently had in mind the general total cost of the system as estimated by me at the time or at times, and have not attempted to carry the details
1378 in my mind.

Q. What kind of wire do you refer to in your estimate of 20 cents per lineal foot? Please describe it so that it can be identified by others in that business. A. Such as that manufactured by the Standard Underground Cable Company, of Pittsburgh, Pa.

Q. What numbers? A. Lead-covered fibre cable. I believe it is called standard.

Q. Do you know what is indicated by No. 18 or No. 19 gauge cable? A. Yes, sir.

Q. Is it that kind of cable you are referring to? A. It is No. 20 gauge wire, two wires constituting a pair, 100 wires constituting a 50-pair cable.

Q. How much of that 50-pair cable do you estimate as being required? A. I have forgotten.

Q. Did your estimate refer to underground or overhead construction or both? A. Both.

Q. How much of each? A. The larger portion of it would be underground, necessarily, in my opinion, for modern exchange practice, and my recollection is that it was therefore based upon such an idea.

Q. My question is, how much of each; how much overhead and how much underground? A. I can't state how
1879 much of each.

Q. Can you state it approximately? A. I have stated it approximately. The larger portion of it would be underground.

Q. You have stated the proportions approximately, perhaps; but you have not stated approximately or otherwise the amount either of the overhead construction or the underground. A. I have stated that I did not know the amount at this moment and could not tell approximately the amount of each. The proportionate amounts I recollect reasonably well.

Q. Can you tell the number of miles of conduit which was included in your estimate? A. I should say that it was considerably less than 100 miles offhand.

(At this point Mr. Charles Darwin Haskins entered the room.)

Q. Was it under or over 50 miles? A. I have forgotten. I wish to say, in this connection, that I have attempted to show

that I would avoid giving testimony that would indicate our private business, where it appears to me it might divulge our engineering plans to competitors, and that I have not kept in mind the detailed estimates, either upon the extent of conduit work or cable work, other than an apparently maximum amount. These maximum amounts I am not altogether clear upon, except in the general proportions which my recol-
1380 lection appears to serve me well in.

Q. I will change the form of the question. Did you know when you were furnishing the information to Mr. Butterworth and the other gentlemen whom you have named in regard to this estimate that it was to be used by them for the purposes of the company which they proposed to organize? A. I believed that it would suffice for information upon which they could calculate.

Q. Were you not to be associated with them in the organization of the proposed company? A. I believe so.

Q. Did you not know that they relied upon you specially for this information? A. I believe they did.

Q. Did you have any intent to deceive them? A. No.

Q. Did you inform them simply that the total cost would be less than $450,000, or did you tell them that it would be about that? A. My recollection is that I informed them that it would be—I have forgoten just what my information to them was.

Q. Do you remember whether you gave them any? A. I believe I did.

Q. Do you remember whether you gave them the result of your calculations and recapitulations as to what would be, in your judgment, the approximate cost of the proposed
1381 plant in Washington? A. I imagine that I would naturally have given some such an estimate.

Q. Do you not recollect whether you did or not? A. I am not certain, but I believe I did give them an estimate of that kind.

Q. What was that estimate? A. I have forgotten the amount of it.

Q. Can you approximate it?

Mr. BIRNEY: Objected to, as this is simply repetition of matters already inquired of of the witness.

Q. Can you approximate it? A. I believe it was something less than half a million dollars.

Q. How much less? A. It might have been $50,000 less, or more than $50,000 less.

Q. What is your best recollection as to the aggregate amount of that estimate? A. I cannot recall the exact amount.

Q. I do not ask for the exact amount, but I ask for it approximately. Within $25,000 would be sufficient for my purpose. A. I would not feel at liberty to give an estimate positively within $25,000 of the cost. I would charge for building an exchange in the city of Washington, as a positive statement of what my proposition to build it would be, except I was intending to base a contract upon it, and therefore as I am not basing a contract or furnishing an estimate to this commission,

1382 I do not feel called upon to give my private figures, as stated before.

Q. I do not ask you to give me any figures as to your estimate now, but I ask you what figures you communicated to those other gentlemen. A. You ask me within $25,000 of my estimate, and I consider that a method of trying to get so close to my figures that the difference would not amount to sufficient to enable me to withhold the information.

Q. You do not seem to understand. I am not asking you to give any estimate or opinion. I am asking you with reference to the estimate you gave to those gentlemen in Washington. A. I have forgotten what the estimate was.

Q. Have you any letters, papers or other data in your office here from which you could get the information required in answer to that question? A. I might have. I am not certain.

Q. Are you willing to look? A. No, sir.

Q. Did you have any correspondence with either Mr. Lambert, Mr. Baker, Mr. Butterworth or Mr. Langhorn, with regard to this estimate? A. I have forgotten.

Q. That could be determined in a few moments by an examination of your letter books, could it not? A. I think not in a few moments.

Q. Will you make, or have you made, that inquiry so

1383 that you can answer the question? A. No, sir.

Q. You have stated that in that estimate you contemplated an exchange of 3,000 subscribers for three exchanges, one providing for 1,500 subscribers and the remaining 1,500 in the other two exchanges. Where, according to your estimate, were those several exchanges to be located in Washington? A. My recollection is that the three main exchanges or the main and its two branch exchanges were to be located one at a point, as first described, not very far distant from the corner of F and 14th streets, and the other two in sections of the city that I cannot describe by names or streets, but which would probably be determined by the number of subscribers within a close range of it. It was contemplated that an arrangement could be had for operating branch and auxiliary exchanges besides the three mentioned, in the public buildings, such as the Treasury Department, the Interior Department, the War, State

and Navy Department, etc., the Navy Yard district, and possibly at other points.

Q. Where were the two auxiliary exchanges to which you referred in answer to my previous question to be located? A. I have forgotten.

Q. Can you tell approximately in what part of the city or how far from the principal exchange? A. I cannot tell approximately, even, now.

Q. Was one of these two to be in Georgetown? A. I have forgotten whether one of these two was to be in George-
1384 town or whether it was to have a separate small exchange in Georgetown. I have an indistinct recollection that one of the exchanges was to be located in the direction towards Georgetown, if I understand Georgetown to be in that direction from the F and 14th streets corner in line with the White House.

Q. That is correct. A. I believe one branch exchange was to be located in that direction.

Q. Was the other to be located anywhere in the neighborhood of the Capitol building in Washington? A. I believe in that direction.

Q. Will you tell me whether it was on Capitol Hill, or on that side of the Capitol which is farthest from the corner of F and 14th streets? A. I cannot recall now.

Q. Would it cost more or less to provide telephone apparatus for 3,000 subscribers in Washington, with one central exchange near the corner of F and 14th streets or three, one located there, another in the neighborhood of Georgetown and the other in the neighborhood of the Capitol building? A. I should give it as my opinion that it would cost less for three exchanges.

Q. How much less; what would be the proportion? A. I should say from ten to twenty per cent.

Q. At any time before you concluded this estimate, did you have before you a map of the city of Washington? A.
1385 Yes, sir.

Q. Showing where the existing telephone conduits were laid? A. Yes, sir.

Q. Did you go over the streets or neighborhoods where these conduits were laid to see the nature of the ground? A. I went over some of them, at least, and I think all of them, that I could learn the location of.

Q. Did you in the same way examine the overhead lines? A. To some extent.

Q. Did anybody go with you over the ground? A. I had an expert make an examination independent of my own for the purposes of advising me of such overhead lines, and somewhat of such underground lines.

Q. Who was that expert? A. I decline to give his name.
Q. Why? A. Because I do not think it would be proper for us to give the names of our employes in respect to those accounts.
Q. Does he live in Washington? A. I believe not now.
Q. Did he then? A. At the time he was there, I think he lived there. Of course he lived there when there. That is not his home, if I remember.
Q. Where was his home at that time? A. I think he lived in Chicago at the time I sent him there.
1386 Q. Where does he live now? A. I am uncertain.
Q. Did you, as to any part of your estimate, take the figures given you by this expert? A. I think that I was guided somewhat by his information in my own conclusions as to the character of the place, and what we would have to contend with in the way of digging or putting up poles?
Q. When did you last see that expert? A. Within a month.
Q. Where did you see him? A. In Chicago.
Q. Was it Mr. Dunbar? A. No; I have seen Mr. Dunbar in Chicago within a month, but he is not the expert referred to.
Q. I think you have not yet directly answered the question whether or not in the estimate you made you took any of the figures given to you by this expert and embodied them into the final result.

Mr. BIRNEY: Objected to, as it has not been testified that the expert gave him any figures, but only information as to pavements and streets. A. I do not recall.

Q. It is possible, then, that the calculations of this expert as to some parts of the plant were accepted by you and went into the final result? A. It is possible.
Q. You refuse to give the name of the man whose figures you may have accepted? A. I do not recall that the ex-
1387 pert gave me any figures; and in replying to your leading questions to the effect that he did give the figures now called to mind, I wish to say that I do not recall what figures, if any, he gave to me, or if he did actually give me figures. I have said that with respect to experts, and have replied to your questions upon that expert, that I have had men whom I considered as experts in determining the character of construction inform me of the conditions in Washington, and have undoubtedly been guided by the information given to me by them. I do not recall that either one of those experts gave me in writing or verbally exact figures, but probably, and as my recollection serves me he did give me information such as I asked of him.
Q. Before you made this estimate were you informed as to

the regulations adopted by the Commissioners of the District of Columbia, and then in force, regulating the construction of telephone poles and other matters relating to telephone construction? A. I have some impression of looking into the matter, and have heard, before the Commissioners, arguments upon the subject of another telephone exchange.

Q. You saw the poles there which were in use by the local company? A. Yes, sir.

Q. Did you see also the manholes along their underground plant? A. My recollection is that I did examine them.

Q. Did you make any estimate as to what it would cost to construct those manholes in the manner in which they
1388 were constructed? A. I probably did.

Q. Was the cover taken off the manholes for you in any case? A. I have forgotten, but I think I have seen the manholes in Washington with covers off. I do not know that they were taken off particularly for me. I do not believe they were taken off particularly for me. I think I have had opportunity of looking into them without that, although I have forgotten just exactly the conditions under which I viewed them.

Q. What was your estimate of the average cost of those manholes, such as you saw there? A. I have forgotten what it was. I did not consider that if I put any manholes in Washington I would necessarily follow the design or character of manhole I saw there.

Q. Were the manholes which were covered by your estimate materially different from those? A. They might have been.

Q. Do you remember whether they were or not? A. I have forgotten that.

Q. What was the average price per manhole which was allowed for by your estimate? A. I have forgotten that.

Q. What is your present opinion as to what it would cost in Washington now to construct manholes as those are constructed? A. I decline to give an opinion.

1389 Q. Why? A. Because I do not wish to give our estimates of cost of manholes or other things in detail.

Q. I would like you to understand that when I ask you for your estimate as to the cost of a telephone plant in Washington, or any part of it, I mean to allow you to include a reasonable amount for profit, and it is so in this case; and I ask you the question again upon that basis. A. I would have to refresh my memory upon the subject of the cost of manholes, to give you certain approximate estimates intelligently.

Q. In the estimate which you made, and which you have given as to the cost of establishing an exchange plant in Washington, did you allow any profit to the contractor or company? A. Yes, sir.

Q. What percentage of profit did you allow? A. I have forgotten.

Q. About what? A. I decline to give it.

Q. Why? A. Because I do not care to say what our profits are.

Q. Was it more than 20 per cent? A. I decline to state.

Q. Was it as much as 50 per cent? A. I decline to state that.

Q. Was it less than 10 per cent? A. I decline to state that.

1390 Q. What kind of poles did you observe were used by the defendant company in Washington within the limits of the city of Washington? A. My recollection is that the defendant company were using a chestnut pole.

Q. Of what height? A. Various heights.

Q. Did you confine your investigations to the city of Washington proper, or did you follow the lines of the defendant's wires outside of the city, throughout the District? A. My recollection is that we figured upon a system that would be used within the city of Washington, and I am not certain that it extended throughout the District; but I think in some parts of the District outside of the city limits proper. I do not know whether Georgetown or the Navy Yard are within the city limits proper.

Q. Do you know whether or not they are included in the territory covered by your estimate? A. My impression is that they are included in the estimate.

Q. Do you know where Takoma is? A. No, sir; I do not. I heard of it, and have a recollection of it.

Q. Do you know where Brightwood is? A. No.

Q. Do you know where Chevy Chase is? A. Yes.

Q. Where? A. Up along the Potomac River, if I recollect.

1391 Q. Do you know where Tennallytown is? A. No.

Q. Would your estimate include an exchange which supplied these places as well as Washington proper? A. I have forgotten. I am impressed with the idea that some of the construction work was to lead up in the direction of Chevy Chase.

Q. That is up along the river, you think? A. I think in that direction. It seems to me that it was contemplated that that at some future time would become quite a residence district; and I have an indisinct recollection that that was somewhat kept in view.

Q. Did anybody who was familiar with the District of Columbia accompany you when you went around to show you the different places you were to see? A. Yes, sir; I was with different people at different times.

Q. Who were they? A. I am unable to say specifically who went upon any particular trip with me upon any particular estimate, but I recall having gone with others in a good many cases.

Q. Who were those other persons, and give us their names? A. I will give you one name that will help you out. I recall having driven around the city with Mr. E. E. Clement.

Q. I appreciate your kindness in helping me out, and will ask you to go a little farther in the same direction and name
1392 the others as far as you can recall them. A. I cannot recall the others at this moment—who they were.

Q. Any of them? A. Upon what specific occasion do you mean?

Q. I do not refer to any specific occasion, but I refer to the people who acted as your guides in taking you around the District to show you where these telephone lines were to run, the cost of which you were estimating. A. I decline to give the names of others.

Q. As to the estimate which you made as to the cost of operating an exchange in Washington after it was built—did you make that estimate? A. Yes, sir.

Q. At the same time you made the others? A. At different times, probably along during the same period that the other estimates were being made, or at the conclusion of them, or thereabouts.

Q. For the same purpose, for the information of the same persons, in connection with the same proposed corporation? A. For my own information in preparing me to be able to submit an estimate if I was called upon to do so by the people who might want to purchase a system, and would require or desire such information.

Q. In the estimates which you made, did the building or buildings in which the central and other exchanges were to be situated figure in the construction account as to
1393 be owned by the company incorporating the exchange, or in the maintenance account as rental? A. My impression is that there was an allowance in the estimates of operating expenses for a reasonable rental for the use of premises.

Q. How much did you allow for rental of the central exchange? A. My impression is that the rental allowance was somewhere between $2,500 and $5,000 per annum.

Q. How much did you allow for the rental of the two auxiliary stations? A. I have forgotten whether the figures mentioned included the three or were for the one separately. I have an impression in my mind at this time that there was a rental valuation figured in the cost of operating of somewhere between $2,500 and $5,000, and that may be for the one ex-

change alone; and that there was no determination—there must have been some determination, I should say, of the others.

Q. How much did you allow in that estimate for the salaries of the president and others in the central offices of the company? A. I believe there was no salary allowed for the president. It is not usual in independent telephone companies to allow an official entitled to occupy the position of president a salary for his official work as president. We consider that if he has interest enough in the business to warrant him in holding that position he ought to look after his own interests.

1394 Q. Your estimate assumes, then, that the president will be a stockholder who will render services for nothing on account of his interest as such stockholder? A. As an official, his interest ought to be sufficient to warrant him in doing the work as is usually done. If he occupy the position of manager or has the routine buisness of the concern besides, we should imagine he would be entitled to compensation for such services as he gives.

Q. You perceive I am not asking you now what might or might not be allowed under various circumstances, but I am asking you what you included in the estimate which you made of the cost of operating the proposed plant in Washington? A. My impression is that with reference to the president that it was to be expected that whoever was to be president of the corporation operating it would not have the duties, routine or otherwise, of management, or operative work to handle, and I do not believe any estimate was made of the president's salary.

Q. Was anything included for compensation for persons or for a person fulfilling the ordinary duties of a secretary, etc., of such company? A. Yes, sir; I think that the compensation for an active secretary was included in the estimate of expenses.

Q. What salary was allowed him in that calculation? A. Probably between $1,500 and $2,500 per annum.

1395 Q. You say "probably." Have you any recollection on the subject? A. No distinct recollection. The sum of $1,500 to $2,500 per annum for a competent secretary in active work in such an exchange would, in my opinion, be reasonable, and would depend somewhat on the extent of his duties.

Q. What, if any, allowance was included in that estimate as compensation for a treasurer? A. My recollection is that the compensation for the treasurer was considered to be less than $1,000 per annum.

Q. Less than $1,000 per annum may mean $1 or $999. I wish you would be a little more specific. A. Well, between

$500 and $1,000 per annum. It may have been an even $1,000. I have forgotten just what it was. I should like to add, if you please, to my answer with reference to the treasurer that it was considered that the office of treasurer should be not only held by some one largely interested financially, but that his duties would be nominally as an officer, and that the active duties of computing the company's accounts in cash and otherwise should be performed by the usual employes in the office of the company.

Q. In that estimate what, if any, allowance was made for a person who performed the duties of a general manager, whether called president or by some other title? A. The estimate in reference to general manager was on the basis of $2,000 for a general manager, whose duty would be to manage and superintend the system as a whole.

1396 Q. Was that person to perform the administrative duties required in the office and also to superintend the outside and inside plant of the company, both in construction, maintenance and operation? A. He could exercise a general supervision over all. He would have an assistant who would either be a foreman or assist as superintendent of construction, the chief operator or manager of the operating department and a chief inspector or manager of the repair or maintenance department.

Q. What salary did you allow to the superintendent of construction? A. I have forgotten, but the usual prices for competent employes in this field were used as a basis of compensation in the expenses of operation.

Q. What do you understand to be the usual compensation of a person performing the duties of superintendent of construction in an exchange of 3,000 subscribers? A. From $1,000 to $1,800 per annum.

Q. What salary did that estimate allow for the official whom you have called chief operator? A. I will give these answers from recollection as near as I can, upon the question of these employes. The chief operator or office manager was figured at from $75 to $100 per month.

Q. What to the chief inspector or superintendent of the maintenance department? A. About $75 per month.

1397 Q. How many operators, aside from the chief operator, did your estimate provide for? A. I believe about 50 to 60, if I recollect. This includes the main and branch exchanges.

Q. At what average rate of annual compensation? A. I believe about $18 per month. My recollection is that it was something less than $20 per month, but I am not sure that it was $18. It was probably somewhere about that.

Q. What allowance, if any, did that estimate make for an auditor or bookkeeper, or his assistants? A. Auditor $1,500, chief bookkeeper $1,200.

Q. Any assistant bookkeepers; if so, how many, and at what average rate of compensation per annum? A. I believe there were two assistant bookkeepers at $50 monthly each.

Q. Did you allow for any clerks or assistants in the central office aside from those covered by the preceding inquiries; if so, how many and at what average rate of compensation per annum? A. I believe there were two collectors contemplated at an average of $50. I ought to qualify that. My recollection is that upon the question of collectors we estimated that it would cost about $100 per month for making the collections, without respect to the number it would employ, or where they were employed, an office boy at $20 monthly and a stenographer at $60 monthly. I do not recall others of the office employes figured upon, if any.

1398 Q. Do you wish to be understood as saying that a business of an exchange of 3,000 subscribers in a city like Washington could be carried on, so far as the employes in or connected with the main office are concerned, upon the basis covered by the salaries you have given? A. I don't recall any additional office employes than those I have mentioned having been figured in the estimate.

Q. In this scheme, who was to attend to the duties of a purchasing agent? A. I have forgotten what provision was made specifically, if any was, for the detailed method of purchasing. I am under the impression that it was calculated that a storekeeper would fill requisitions for materials, and the manager, together with the secretary, would pass upon and order the same under the O. K.'s of the department for which the material was ordered.

Q. You have not allowed any compensation for a storekeeper so far. What did your estimate allow for a person to perform the duties of that office? A. I should say that a storekeeper would have been had at from $60 to $75 per month.

Q. In this scheme, is the stenographer to perform the duties of a typewriter? A. I should imagine so.

Q. Are you now giving your present opinion as to what would be proper compensation for these various officials, or are you giving what I called for, the contents of the estimate which you made some time ago with reference to the

1399 cost of operating a plant in Washington? A. I am basing my estimates upon my recollection of those made, which might naturally be influenced somehow by my present opinions, but are from recollectionn of the estimates made at the time of figuring on this plant. I stated that I

could not recall in detail just what each was figured at, but I recall that the estimates were based upon general information as to the costs elsewhere, as I recollect them now, and I may be guided or influenced somewhat by that. I mean to recollect as nearly as possible the calculations made in the estimates at the time mentioned.

Q. Was this estimate as to the cost of operating the Washington plant reduced to writing at that time? A. I undoubtedly made a good many calculations in writing.

Q. Was not the final result embodied in a written statement? A. It might be said to have been reduced to a written memorandum.

Q. What was done with that memorandum? A. I have forgotten just where it is at this time, but I think it is somewhere among the papers of mine or of this company.

Q. You are requested to produce it. A. I decline to do so.

Q. Why? A. Because I do not wish to furnish the
1400 estimates upon which I base the calculations of operations in Washington.

Q. The company of which you are president is not engaged in the business of operating exchanges anywhere, is it? A. Except in an advisory way, I think not. It is part of our work to advise people with reference to cost of operations, taken from data gleaned in the course of our business.

Q. Mr. Keelyn, the testimony introduced on behalf of the defendant in this case has tended to show that the cost of operating a telephone plant in Washington is about $70 per station. You have testified that such an exchange can be carried on in a proper and satisfactory manner at a cost of from $12 to $25 per telephone. Do you mean to state to the court which is to pass upon the value of your testimony that you refuse to allow us to see the elements which enter into your estimate, so that it may compare them with the elements furnished by us and see which is more probably right. A. I don't think that the elements which would enter into the cost of operating such a telephone system as I have estimated upon in the city of Washigton would necessarily involve the same parallel estimates of cost in such a system as you assert was testified that the defendant assumed to cost it in the city of Washington. The two systems in my estimation were somewhat different, and it would clearly be my opinion, from the great divergence of estimates of cost, that there is something wrong about the character of estimates that
1401 would make it cost $70 per telephone to operate a telephone system in Washington.

Mr. WORTHINGTON: I here object to the witness' statement or argument in reference to the force of our testimony, and I ask you to answer my question.

A. I refuse to submit the detailed data or memorandum which I may have in writing and which is not handy for me to produce here.

By Mr. WORTHINGTON:

Q. You have intimated in your last answer or statement that there are some differences between the Washington plant as it is now constructed and operated and the one which is covered by your estimate. Please state what those differences are. A. It would appear to me that a charge for a president's salary, which I am informed to be about $25,000 per annum in the case of the defendant corporation, is extraordinary, exhorbitant and unnecessary for the purposes of directing and managing both a telephone system such as is in use in the city of Washington, or might be put into use, either one; that such direction and management is not reasonably worth to exceed $3,000 to $5,000 per annum. Is there any more Mr. Worthington?

Q. You have not answered my question at all. You stated a few moments ago, as I understood you, that there were some differences in point of construction between the telephone plant now existing in Washington and that covered by your estimate. I ask you to state what those differences are, and did not ask your opinion as to what the president or any other person connected with that company receive or ought
1402 to receive. A. I suggest that counsel have re-read to him again the question and answer for his own information, with due deference.

Q. Without regard to what questions I have previously asked you, I now ask you to state whether there were any, and if so, what differences between the telephone plant in the city of Washington when you made your estimate and the telephone plant covered by your estimate.

Mr. BIRNEY: Objected to on the ground that it does not appear in any of the evidence that the witness has so informed himself of the existing plant in Washington as to qualify him to answer the question. On the contrary, it definitely appears the other way.

A. The difference between such a plant as we would have made the estimate on and such a plant as existed in Washington, if I made the examination thereof, would undoubtedly be considerable. How to give a clear description of the differences would involve some thought and the time to describe all the differences, if I were aware at this moment of all the differences, would take a considerable length of time, probably.

Q. State those that you do recollect. A. The system as I

understood it to be in Washington in use by the Chesapeake & Potomac Telephone Company involves one main central office, into which were leading subscribers' lines approximating about 2,000 subscribers' capacity, with auxiliary means for connecting with a good many more subscribers or tele-
1403 phone lines. As before stated, we contemplated as advisable a system subdivided and more extensive in number of subscribers, connected with the system than that then in use. That is a difference.

Q. Do you remember any other difference? A. The system then in use by the Chesapeake & Potomac Telephone Company involves the use of what is known as a multiple jack switchboard, which we considered would be more expensive in operation and more expensive in its first cost, if obtainable, than the system of central office equipment upon which we had based our estimate. At the time of these estimates there were in use by the Chesapeake & Potomac Telephone Company a large number of out-of-date telephones, known commonly as Blake transmitter outfits, which we considered unfit for furnishing satisfactory telephone service, we having abandoned that type of transmitter telephone ourselves; and we contemplated the installation of a more up-to-date and better form of telephone instruments. At the time there were a considerable number, if not the greatest number, of the Chesapeake & Potomac Telephone lines of ground or return line circuits, commonly called, and we calculated that none but strictly modern metallic circuits, composed practically of two wires to each telephone, would be put into use in the plan of the system. I do not recall specifically other distinguishing marks at this moment.

Q. What kind of a switchboard is included in your
1404 estimate? A. Our up-to-date apparatus, whatever it might have been engineered at the time. I have forgotten exactly just how far the details were carried to at that time.

Q. Then you cannot describe the switchboard which you proposed to install in Washington, and the cost of which was included in your estimate? A. Not with certainty.

Q. Can you refer to any city in which there was or is now in operation a switchboard such as that which was included in your estimate for Washington? A. A description of the switchboards at Ft. Wayne, Indiana, would not be far removed from a description of the switchboards for Washington, as I contemplated at the time.

Q. To return to the operating expenses: You have given us the proposed salaries of certain officers and employes. What other expenses of operation were included in your estimate? A. There were linemen.

Q. How many linemen? A. I have forgotten the number.

Q. What was the total amount you allowed annually for their compensation? A. I have forgotten that.

Q. Can you approximate either? A. It is my recollection in approximating the expense for linemen we followed somewhat up-to-date estimates and costs. There are two ways—

Q. I do not ask you to drift into a discussion of what
1405 linemen ought to cost, but I am asking you what that estimate included? A. You are asking me if I could approximate them?

Q. Yes. A. I am trying to give you an approximate estimate, with a clear idea of methods of approximation.

Q. Have you any recollection at all of what that estimate included as to linemen? A. I have a recollection that it included a double estimate for linemen, those linemen who would be employed in reconstructing already existing lines and those who would be employed jointly with them in constructing new lines, which is common and customary in the operation of telephone exchanges. New lines are being constructed from time to time. The regular force of linemen is usually employed upon the construction of these new lines. It is at times the custom to charge the total expenses of these linemen to the fixed expense account or maintenance account, when in fact a proportion, and a large proportion, of these linemen's expenses should be charged to new construction.

Q. Approximately, what did you allow in that estimate for compensation to linemen engaged in maintenance proper? A. My impression is that five linemen were considered sufficient to maintain the existing lines, or overcome what we call in telephone practice line troubles.

Q. What was the compensation allowed those linemen annually, taking them all together? A. I think $50 per
1406 month average—$3,000 per annum

Q. Did you allow for any other salaries or wages in connection with maintenance? A. I think two or possibly three inspectors were calculated.

Q. What did you allow inspectors? A. About $3,000 per annum all together. It was contemplated in the estimate that certain or uncertain of the new work—I mean by that some parts of the new work, such as possibly locating a new telephone in the premises of a new subscriber and connecting it to the line—might be done by some of the inspectors, and that other employes upon new construction work might at times help in the work of inspecting, and that there would be an off-set equal to the two fairly between the estimates for linemen and inspectors, the amount of work they might give to new construction off-setting the amount of work that the new construction gang might give to existing plant.

Q. Did you allow anything in the way of wages to persons engaged in maintenance proper except to linemen and the two or three inspectors in addition to the salaried officials already enumerated? A. I do not recall.

Q. Are you able to state whether this force was expected in that estimate to do all that work of maintenance of a telephone plant of 3,000 subscribers in Washington? A. This particular force last mentioned?

Q. No; I mean those whom you have enumerated. A. All of them together?

1407 Q. Yes; that is, the chief inspector, the five linemen and the two or three inspectors. A. Oh, no; they would be assisted by their superintendents. There would always be a switchboard caretaker, at a salary of about $800 per annum and a carrier or wagon driver with a horse and wagon. This carrier or wagon driver and horse and wagon, I believe, were estimated at about $1,500 per annum. That was, I think, for the work which would be performed by all of them, including the care of the horse and wagon and the man's wages. It seems to me that there may have been some other employes there that I do not carry in mind at this moment.

Q. Are you able to state whether or not the chief operator and the superintendent of construction, the five linemen, the two or three inspectors and the man with the wagon were expected to take care of a plant of 3,000 subscribers in Washington without any additional help? A. With the manager I should say that a nominal sum above that for incidental help, for those I cannot think of at this moment, would cover it—say not to exceed $2,500 per annum for such additional help as might be needed. I am considering in this estimate the rule as stated heretofore by me that the construction gang employed upon new construction are sometimes, at least, in emergencies or at other times, employed in helping upon maintenance, and that in turn the maintenance gang or force are employed in nearly all of their service, possibly excepting directly the switchboard operators themselves, in furnishing some service

towards new construction or new plant. This runs all 1408 the way from the manager down to the inspector's office boy. I have not calculated in here, excepting within the possible realm of $2,500, nominal sum estimated, engineering expenses such as might have been required, believing that such engineering services to begin with would be included in the cost of plant; for the number set forth was contemplated in the expense account, namely 3,000 subscribers in use. The engineering service would largely be utilized in the direction of new equipments, if not entirely so, and therefore only a portion of it would come within the nominal sum of $2,500 included.

Q. Have you given us everything you can think of in the way of salaries or wages to persons employed in carrying on a telephone system of 3,000 subscribers in Washington? A. I have tried to bring to mind the number of employes at an expenditure for expenses in that direction such as would be required to maintain, after once completely installed, 3,000 subscribers' telephones in use, and have not attempted to add to what might in practice occur, that of taking out, for instance, a 50-pair cable installed and replacing it with 100-pair cable, so that a better accommodation for future purposes might be had for increasing subscribers. This is frequently done in practice, and I explain it for that reason.

Q. Have you included everything which you can think of now, so far as salary and wages are concerned, required
1409 to carry on such a plant as is referred to? A. So far as I can recollect at this moment.

Q. Suppose that in such an organization you should find that your underground wires are being interfered with by electrolysis, for example. Who would attend to that matter—find out what the trouble was and find the remedy and superintend its application? A. Inspectors ordinarily are in charge of the question of troubles. The manager of a telephone system ought to be competent to know whether his employes, such as I have mentioned, are competent to do this.

Q. Do you think a man who could be employed as chief inspector at a salary of $900 would be competent to deal with such problems as those? A. I have in my employ here a man who worked for some years at a salary of $75 a month who, at the time he was so employed, at such salary, was as capable, in my opinion, as any man in the city of Washington to determine such difficulties.

Q. Who is he? A. Mr. Clausen.

Q. My question is addressed as to what can be done in the city of Washington. A. I answered you that such a thing has been done. I believe that I could have furnished a man at the time of the estimate. I believe that I can furnish a man now at the price indicated, who is thoroughly competent to do the duty of chief inspector and grapple with the problems suggested. I am assuming that a plant built in Washington
1410 upon modern plans of engineering would to a great extent anticipate these difficulties and provide against them.

Q. What would occur under this scheme in case a sleet storm in Washington should damage the overhead plant to the extent of $10,000 or $15,000 in a single night? A. I cannot assume such an occurrence from the plans contemplated by us in our estimates on Washington. I can easily understand how upon

old line construction such a thing might happen in a sleet storm, but I want to add that the amount of $15,000 for damages in a sleet storm is an extraordinary one.

Q. My question is, suppose that did happen; what provision is made for it in your scheme of employes? A. I do not recall what specific provision was made in the estimate contemplating such a thing, if a specific estimate was made, other than the general conjecture that the average expenditures for excess work would cover it. My opinion now is that such a loss would not occur oftener than once in ten to twenty years under proper telephone exchange engineering, as practiced to-day.

Q. I have understood you to say that the overhead lines which you proposed to erect in Washington, as covered by your estimate, were practically sleet storm proof. Will you please explain the construction of that overhead plant which would, in your judgment, make such an occurrence as I have referred to impossible? A. The counsel's understanding seems to be rather hazy. I can suggest that a proper cabling system
1411 for overhead wires, such as indicated in my earlier testimony, probably would involve a less extent of sleet storm trouble maintenance than that which I examined in use by the Chesapeake & Potomac Telephone Company in Washington, a great deal of which was open wire work without particular definite arrangements as to what other wires it crossed or recrossed—a sort of haphaazrd from time to time construction which might upon good engineering examination be revised to a saving in maintenance.

Q. In your estimate, what kind of poles were included for overhead plant? A. Largely chestnut, I believe.

Q. Of what dimensions? A. Various dimensions, to suit the particular locations.

Q. Give the maximum and the minimum and the average, stating both height and diameter. A. I cannot recall the number and the particular heights, but they varied from 20 feet to a height of 60 feet, the latter, in some cases, spliced, I believe. By a splice I mean a joining together of two poles to constitute one for carrying the lines. These poles in size would vary from 5 inches at the top to 8 inches at the top. The number of poles—

Q. How much at the bottom? A. We do not usually determine the value of a pole by its size at the bottom.

Q. Its value to withstand a heavy weight depends very largely on its diameter at the bottom, does it not? A. In the selection of poles it is expected that a pole of a certain length
1412 and a certain diameter at the top will result in finding a closely determined average size at the butt or bottom. It is an irregular pole, in other words, that would differ at the

bottom from an ordinary size. An 8-inch pole runs a little larger at the bottom in chestnut than at the top, while a cedar pole runs a great deal larger at the bottom than at the top. In Washingon it was assumed that some of the poles would necessarily be carpentered, that is, squared or trimmed, to meet the demands of public appearance. In other occasions this would not be necessary. I call to mind in my investigations—

Q. I am asking about the poles which were included in the estimate for the Washington plant, not about anything else. A. That is what I am talking about. I call to mind one specific instance during my examination of lines there and a conversation with a Mr. Royce, of Royce & Marean, as to the character of certain chestnut poles at a point near the corner of 14th streets and Pennsylvania avenue, which pole was squared and octagonal.

Q. What was the average height of the pole covered by your estimate for the Washington plant? A. I do not believe we averaged the heights in the estimates.

Q. How many poles did you allow for? A. I should approximate somewhere between 3,000 and 5,000.

1413 Q. Can you not come any nearer than that? A. No.

Q. What allowance did you make for the cost of those poles set in the ground ready for the cross-arms? A. I do not think we estimated the poles separately set in the ground and cross-armed. I do not recall what estimate we made on the whole of the poles nor upon them separately at this time.

Q. Can you approximate either? A. Not sufficiently to form an intelligent conclusion.

Q. To return to the expense account: What allowance, if any, did you make for the cost of materials to be used in the maintenance of the 3,000 subscribers' lines? A. I have forgotten.

Q. Approximately. A. I don't believe I ought to attempt to give that offhand or without some study. I do not recall what I did estimate it at.

Q. You have no objection to giving it except that you cannot remember it with sufficient clearness to make your recollection of any value? A. I do not recall what I did estimate. I think it might be misleading if I attempted to.

Q. Is that your only reason for not stating it? A. Yes, sir.

Q. Will you tell me why it is that you have testified in this way as to your at times very doubtful recollection of these details, and have declined to answer as to some, solely on the ground that you have no recollection, and you still re-

1414 fuse to produce and show us here the papers, so as to show how they stood at the time in your mind? A. I have already indicated that I was fearful of disclosing matters

of a private nature in our business. I do not wish to detail all of my reasons, therefore, upon some matters that I have been asked about. I have been able to more readily call them to mind than others.

Q. I now again formally request that you produce here, in order that we may put it in evidence, the memorandum or statement containing the estimate which you made of the cost of operating the proposed plant in Washington. Will you do so? A. I cannot with certainty agree to comply with this request, because I am not sure whether I could furnish all of this detailed estimate. I am a busy man, both night and day. I have tried to give this commission the benefit of my time in an examination during a period of some hours or days, to the neglect of my other business. I have sought to obtain some information from our files and papers that the counsel for defendant requested or demanded, rather than appear reluctant or hidden, and have found it a very difficult task to get to or obtain them. I do not know now how long it will take me to obtain the papers in question, even if I could obtain them. I therefore decline to make searches that are indefinite or to submit papers that are not within my reach.

Q. Then I ask you to whom it was you sent or delivered that estimate, so that we may obtain it or a copy of it from
1415 that source? A. I am of the belief at this time that I did not deliver any estimates or copies of estimates outside. My recollection is that in these matters, upon these estimates, verbal reports were made. I wish to say that I object to the presence of Expert Haskins while I am testifying. I have continually objected to his presence during my examination.

(At the request of defendant's counsel Mr. Haskins at this point retired from the room.)

Q. Has your refusal to furnish any information or paper or to look for it this afternoon been based in whole or in part upon the presence of Mr. Haskins? A. I should say not particularly, except that I have generally indicated that he was an expert, in my opinion, employed by a competing company, who have our welfare in mind sufficiently to constantly antagonize and attempt to intimidate us, and I do not like to give testimony in the presence of an expert whom I believe to be employed for the purpose of interfering with and injuring my business.

Q. Mr. Keelyn, before this examination proceeds any farther, I would like to state upon the record for your information just what is the situation of this case. An act of Congress has been passed which fixes the rates at which this defendant company

is allowed to charge its subscribers. It is claimed by the defendant, and its evidence tends to show, that those rates are such that if they are enforced will result in the absolute
1416 destruction of the interest of every stockholder in this defendant company. You have given testimony which tends to show that the rates fixed by the act of Congress are not only not unreasonable, but if anything too high. It therefore becomes of the utmost importance to the defendant and to the court which tries the case to know precisely what was the basis of your estimate and to have anything in relation to it which will throw any light upon it. You have shown by your testimony that as to most of the elements involved in that estimate you either have no recollection at all or have a very doubtful one. Do you wish to have the court understand in such a situation that you will not spend a few minutes in looking for the original estimate or estimates, and will not, if you find them, produce them in order that we may put them in evidence? A. I answer that I have made some search for the estimates and details, hoping to be able to present them in tangible and definite form as made by a recapitulation in writing, so that it would lessen the time of inquiry and be more clear as a statement. My investigation was unsuccessful. I have not yet found the papers asked for, although I have made some effort to do so. I would not be unwilling to make a written statement of what my observation at this time shows the cost of the operation of such a telephone system to be.

1417 Q. You were asked on your examination-in-chief if you had made an investigation and made an estimate some time ago, and it is to that estimate that the cross-examination has been directed. Now you have several times this afternoon stated that you would not look for that estimate, and that if you did find it you would not produce it. Is that still your position? A. I have said in my examination this afternoon that I would refuse to make the search at the moment.

Q. We now request you to make the search and will wait until it is definitely determined whether you can find it or not. A. The matter of the search seems to me at this time to be so difficult that I must respectfully decline to make it.

Mr. WORTHINGTON: Counsel for the defendant now give notice to counsel for the complainants that on account of the refusal of the witness to look for or to produce the estimates referred to, they will move the Court to suppress the entire deposition of this witness, and especially those parts which relate to the making of an estimate by him, both as to the construction and as to the cost of operating a telephone exchange in Washington.

By Mr. WORTHINGTON:

Q. In your estimate of the cost of constructing a plant in question in Washington, what allowance was made for the cost of the switchboard in the central exchange, including everything within the walls of the building in which the exchange is situated? A. My recollection is that the cost
1418 of the switchboards and central office equipment on the basis of 3,000 subscribers was less than $45,000.

Q. How much less? A. I prefer not to state. The cost of the telephones was somewhat less than $40,000.

Q. How much less? A. I prefer not to state.

Q. How many telephones? A. 3,000.

Q. What was included in your estimate of something less than $45,000, which you have described as the switchboard and other paraphernalia of the central office? A. Switchboards, generators, operators' equipments, drops, jacks, plugs, cords, distributing boards, inter-connecting wiring and all of the devices and apparatus necessary to place them in first-class working order for a central office public telephone exchange equipment using 3,000 telephones.

Q. What do you mean by generators? A. In a central office there is in a switchboard usually an auxiliary generator for each operator, so that if something should happen to the main sources of the current supply, these hand generators may be used by the operators. Also, the generators which furnish the main supply of current to the switchboards.

Q. What amount was allowed in that estimate for the switchboards and other appurtenances, including all the central office paraphernalia in the two auxiliary exchanges? A. I
1419 do not think the estimate which I mentioned as being covered by less than $45,000 was exclusive of the two branch offices, but inclusive of them. The specific cost of equipment for the two branch offices I cannot recall at this moment, if there was one. I have indicated before that my recollection was that these were somewhat indeterminate as to their size, and I cannot recall now whether a specific price for either of them was estimated specifically, separate.

Q. Would the cost of switchboards and other central office paraphernalia for an exchange of 3,000 subscribers at one central office cost more or less than when it was divided among three offices in the manner you have indicated? A. The cost undoubtedly would be slightly more, but—

Q. Slightly more in which case? A. Where the offices were divided into three offices instead of one; but not a great deal more, not 5 per cent more, in my estimation now; and I believe I had about the same opinion then as I have now.

Q. What, if anything, was allowed in your estimate for the cost of trunk lines between the three exchanges? A. The cost of the trunk lines between the exchnges I do not recall.

Q. Do you recall whether it was included in the estimate at all? A. I am quite sure, if I recollect, that it was included. I believe the estimate was based upon a maximum num-
1420 ber of trunk lines between the exchanges, providing somewhat for future increase.

Q. Did it allow for trunk lines between two auxiliary exchanges as well as between those auxiliary exchanges and the principal office? A. Yes, sir.

Q. Do you recall approximately or otherwise about how much per foot or per mile these trunk lines were estimated to cost? A. Not other than I have indicated my recollection of the cost of cable. In some way I recall the cost of cable, and I think it is because I had a consultation with the manager of the cable company at about the time I was on one of these trips.

Q. Suppose the central office to be equipped for 1,500 subscribers and each of the auxiliary exchanges for 750; about what amount of cable and other equipment was included in your estimate to connect the two? A. I cannot recall what the estimate was in that respect. As indicated, I do not recall the distance in locations from one point to the other, even.

Q. I was trying to get at the amount of cable required, without reference to length, so that we might, as we can, figure out the distances for ourselves. A. It is my recollection that it would require less cable for the subdivided exchanges than where there was but one central office.

Q. There would also be a saving in the length of subscribers' lines, would there not? A. I mean by reason of the sav-
1421 ing in length of subscribers' lines, averaged. In other words, the total amount of cable including the trunk cables between exchanges and the subscribers' lines would not be as much in total by a considerable amount as if all the subscribers' lines ran into one central office.

Q. How much cable was computed in your estimate for three exchanges? A. My recollection is that the estimate for cable included that for 4,000 subscribers' lines and for what cable might approximately be used between the exchanges.

Q. How much cable was that? A. I have tried since I have been testifying here at various times to recall what the estimate for cable was, but I cannot approximate it even in my mind.

Q. How many miles or feet of underground conduit are covered by your estimate for the Washington exchange? A. I cannot recall that.

Q. How many duct feet or miles? A. I have forgotten.

Q. In other words, then, Mr. Keelyn, you are unable to give us the data upon which your estimate of the cost of constructing a telephone plant in Washington is based? A. Yes, sir.

Q. Then we must take your estimate in the lump or not take it at all? A. Except so far as I have tried to give it to you in detail.

1422 Q. How far below the surface did your estimate propose to put conduits in Washington? A. I have forgotten.

Q. Can you approximate it? A. No.

Q. What proportion of the streets in which your conduits were to be laid were covered with sheet asphalt? A. I have forgotten that.

Q. Can you approximate it? A. No.

Q. In your estimate of expenses of operating the plant in Washington was any allowance made for depreciation? A. I have forgotten whether one of the estimates contemplated a fixed sum for depreciation; and yet it appears to me that there was some talk of applying a 5 per cent amount for depreciation.

Q. Have you any definite recollection as to what allowance was made for depreciation? A. I do not recall just what the allowances were, except, as I have stated, I think there was some talk about 5 per cent.

Q. You said on your examination-in-chief that in making the estimate, as I understood, you considered it would be better engineering in Washington to have three exchanges than one. What do you mean by that? A. Modern practice, in my opinion, recommends subdivided exchanges instead of one common central office.

1423 Q. To what extent do you carry that? Why, if it would be better to have three exchanges than one, would it not be better to have six than three? A. It would undoubtedly be better in the city of Washington to have six than three, if you will include all the auxiliary exchanges that Washington would warrant.

Q. Then why would it not be better to have twelve than six? A. There is a happy medium between handling six and twelve. I do not know specifically that it would be better or worse at this moment to have twelve than six, and yet it might be advisable to have twelve exchanges in Washington. We find that in New York and Chicago, six or seven or eight, or even ten, exchanges, some of them mains and branches, others auxiliary, are advisable. I say "we." I mean the people who operate the telephone systems here. The tendency, in other words, is in this direction, as shown by the engineering of this company and that of the Bell Company.

Q. Do you know how many subscribers' lines are connected with the principal exchange in Chicago now? A. No; except from general information.

Q. What is your general information on that subject? A. I am not as thoroughly informed upon the Chicago Telephone exchange as—

Q. Have you not referred to the telephone exchange in Chicago as illustrating your position about the management of several telephone exchanges over one? A. Yes; I am informed generally, as stated, that the system in Chicago involves
1424 between 10,000 and 20,000 telephones. I never have counted the lists myself, but have read reports from time to time, issued presumably by the officers of the Chicago Telephone Company. I have tried to keep posted on its affairs somewhat, but do not place myself in the position of being absolute or positive in any one determination. As stated, I am informed from good information that there are between 10,000 and 20,000 telephones within the main system of the city of Chicago, and possibly 25,000 to 50,000, maybe 300,000 or 400,000 telephones connected with it by auxiliary long distance lines in other cities.

Q. My question was how many of them are connected with the principal exchange directly? A. They are all connected with the principal exchange through lines that enable subscribers in the principal exchange to intercommunicate with them.

Q. My question is how many subscribers communicate directly with the principal exchange, and not through any auxiliary exchange? A. If I understaad your question to be how many subscribers are connected by their lines particularly and specially with the main exchange, so-called, in Chicago, I should say something less than 5,000. That is, there were something less than 5,000 a short time since, but I am informed that this became cumbersome and inoperative for good service, and as a result, a division of it was made by the establishment of what is known as the Harrison ex-
1425 change, and by the separation of more of the main exchange by small auxiliary exchanges in different parts of the main exchange district, which has been somewhat accomplished, and I understand is now going on. I have a circular letter, if I recollect rightly, giving such information, over the name and presumed signature of the proper officer of the Chicago Telephone Company.

Q. Please produce it. A. It is at my residence, I think, at Evanston, where my personal telephone is located.

Q. Can you tell me any instances in the history of telephone exchanges in this country in which a company having a cen-

tral exchange of 3,000 subscribers or less has divided it into several exchanges? A. My recollection is that the Fort Wayne (Indiana) telephone exchange, having less than 3,000 subscribers, was divided, and a branch exchange added more successfully and satisfactorily than before, with one office. The Newark Telephone Company exchange, at Newark, New Jersey, was operated with one central office, and upon reconstruction was subdivided into several, or two or more exchanges.

Q. Any other? A. Having less than 3,000 subscribers?

Q. Yes; having 3,000 or less, I said. A. The Milwaukee, Wisconsin, telephone exchange, Bell system, was subdivided into more than one exchange.

Q. Has it less than 3,000 subscribers? A. At the
1426 time of subdivision, yes. I do not know the number at present. I have heard of a great many others, and have had some information upon them, but I cannot call to mind sufficiently to be explicit further.

Q. Do you know whether a new multiple board was used? A. Yes, sir.

Q. Both before and after the subdivision into several exchanges? A. Yes, sir; the main office was equipped with a multiple switchboard, Bell or Western Electric type.

Q. How many sub-exchanges were introduced? A. I do not remember the number, one or more.

Q. When was that done? A. Within three or four years. I do not remember the date. It seems to me it was within three or four years.

Q. You have stated as to the rates charged by what you call the Independent telephone companies in Indiana and Illinois, the highest rate for business is $50 and the average rate not exceeding $24. In which of those cities is the highest of these rates, $50, charged? A. My recollection of this matter in my direct testimony was that the maximum rate did not exceed $50 in any of the independent telephone exchanges in the States mentioned with which I was familiar, and that the average rate of those with which I was familiar was about $24, in my opinion, or would not exceed it. In Indianapolis, Indiana, I am informed that a rate of $50 or less is being established as the contract rate. The exchange is not in
1427 operation, and in order to answer the questions upon rates I had that in mind as one of the places where the rate was high.

Q. Do you remember any other city in Indiana or Illinois where the rate charged by the independent companies, as you term them, is $50 or approximating that? A. None of them as high as $50 that I know of, unless it is in Indianapolis. You are speaking of business telephones?

Q. Yes; I am speaking entirely of business telephones. A. That would be considered a very high rate by those operating the independent telephone exchanges, where I am familiar with them.

Q. What are the highest rates, then, in those States outside of Indianapolis, referring, of course, to what you call the independent companies? A. $36 per annum for a business telephone is considered a maximum for rental.

Q. Then if the miximum is $36 and the average about $24 there must be a number of towns where the rate is considerably less than $24? A. Yes, sir; a great many of them.

Q. What are those towns in a general way? If you can designate them as a class, instead of naming them, it will suit me. A. You mean by number of telephones?

Q. Any way you can specify them. If it is as a rule those that have the lowest number of subscribers, which charge the lowest rates; please state that. If there is any other
1428 line of demarcation, I would like to know what it is. A. It does not always follow that by reason of the number of subscribers the rate is lower. At Harvard, Illinois, using nearly 200 telephones, the maximum business rate is $18 per annum, I believe, for regular service.

Q. Without spending time on details, can you tell us whether or not as a general rule, not speaking of specific cases, but as a general rule, is the higher rate to be found in the offices having a small number of subscribers or a large number? A. As a rule, I should say that the rate was higher in the larger cities.

Q. Can you explain how it is that the more the subscribers the higher the rate? A. In the larger cities, by reason of the past example and opportunities, the users will pay a high rental more readily. Cities having telephone service have in the past been graded somewhat upon this policy, a higher rate of rentals being charged in the larger cities than in the smaller ones; and it is frequently the case that a higher grade of equipment is furnished, but not always. The disposition of the company or owners is frequently the cause of establishing a low or high rate. I find that in many places where precisely the same cost of construction approximately is involved—

Mr. WORTHINGTON: I object to all this part of the answer as not responsive to my question and wholly immaterial. I am asking for facts and not theories.

1429 Mr. BIRNEY: He is stating facts.

Mr. WORTHINGTON: I asked him to state simply what the general rule is in relation to the proportion between rates and the number of subscribers. I do not ask him how he accounts for it. I object to his interpolating his reasons into the answer.

A. (Continuing) the charges varying considerably. In one case the business rate would be $30 and in another case $24 per annum, respectively, and frequently where the latter rate under these circumstances was established, the census of the plant in improvements and profits has shown better results. There are many places where the business rate charged per telephone runs as low as $15 per annum, and where the owners have expressed to me personally their satisfaction with the investment.

Q. Name some of those towns in which the rate for business is $15 per annum. A. My recollection is that Rushville, Indiana, has such a rate.

Q. How many subscribers? A. I believe there are about 200.

Q. Name another. A. I believe the rate at Auburn, Illinois, is $15 for business purposes.

Q. How many subscribers? A. Less than 100.

Q. Name another. A. I do not recall any more at present.

1430 Q. Will you tell me if you can why it is that if business can be done at a profit in these towns at $15 per annum it cannot be done at a profit, say, in Indianapolis, Ft. Wayne, or Detroit, at the same rates or lower? A. The character of expense involved in those places where the rate of $15 is charged for business telephones per annum is of an extremely conservative kind, and at what, in my opinion, is a very low rate and not practical in most places.

Q. Why not? A. In the low-rated places they are satisfied with a very small profit for their expenditure of money investment and service in caring for the investment or keeping up the plant.

Q. In your judgment, could the telephone business be carried on in either of the three cities which I have named at the rate of $15 per annum without a loss? A. In Ft. Wayne or Detroit?

Q. Ft. Wayne, Indianapolis or Detroit? A. I should consider that rate too low to establish in either of those places.

Q. Then why is it that with 100 or 200 subscribers there is a small profit and when you multiply the number by 10 there is none? Why does not the same rule obtain which obtains in other businesses, that the more customers you have the more profit you make, when you sell at the same rates? A. As a general proposition, I believe that in telephone service the

1431 actual cost per telephone of operating does not increase with the increased number of telephones, although my conclusions are at variance with a good many people who have been in the telephone business. My experience has

given me the information that the amount of proportionate increase in service is very little more per telephone subscriber, if any more, with 500 telephones in a city than with 300; that when a telephone exchange has 300 telephones in use, it might be reasonably said to have a thousand or more telephone patrons; that when such a telephone exchange increases from 300 to 500 telephones it involves the more important of the thousand or more patrons it already had when it only had in use 300 telephones. Where a telephone exchange of 300 telephones is in use and the rate, for instance, charged is $50 per annum per telephone, my opinion is that a great many people who do not feel able to afford the $50 do not subscribe for and have placed in their own premises telephones, but are telephone patrons nevertheless in the sense that they make use of the telephones already in use; that where the rate is reduced from $50 to $30 per telephone, a large proportion of these patrons who have lately been using other telephones, are among those who subscribe for and take of the additional 200, for instance, between 300 and 500, and thereby release from the service of the 300 that much work, except that they add to it in the additional 200, making 500. Primarily a telephone exchange begins as a nucleus with the busiest people in a city. As it grows it stretches forth to those who have less actual need for it.

The more it grows, the more it adds to its subscribers
1432 those people who have less use for it and those who have already been using it. This is particularly true of a telephone exchange where the rates are decreased. For instance, at my home in the city of Evanston I find that by reason of what I assume to be the high rate, a telephone is made use of constantly by a cab-driver, for instance, who has upon this card which I present herewith "Telephone 323." This cab-driver I call is at this number. I have informed myself that he has no number in the book of subscribers for Evanston; that the telephone No. 323 is the telephone subscribed for by another person, who undoubtedly pays the regular rate for it, and therefore my assumption is that if the rate was sufficiently low, Mr. Bryant, having use for a telephone in his business, would have one and would relieve the telephone exchange of the service through telephone No. 323 and use the service through such telephone as he had engaged. I mention this specific instance in line with a general knowledge I have of a great number of instances that I have investigated within the city of Chicago and elsewhere, where professional men, lawyers and others in our large buildings have their regular cards inprinted with the telephone number of some telephone in the premises of a subscriber convenient to their offices, and pay possibly proportions of the rental for such telephones and make use of it

to a considerable extent. I have talked with a number of these—

Mr. WORTHINGTON: I must interpose an objection to going into details in this matter, not one word of which is in answer to my examination.

1433 By Mr. WORTHINGTON:

Q. I will ask you whether I understand you to say that your experience is—and I do not ask you for that experience, but is it the result of your experience—that the greater the number of telephones in an exchange the less the rate which may be charged and still have a profit? A. My answer, as I have been making it, was in line responding to this same inquiry.

Q. You were giving your experience, but not the results of it. I do not ask you for your reasons, but for the result of your experience. We might stay here a week, hearing all you might say on the subject of your investigations. All I want to know is the result of them. A. The result of my experience is that the increase of a telephone exchange from 300 to 500 telephones does not increase the cost of operation thereof in the increased average per telephone. In other words, in a telephone exchange using 300 telephones, if the cost of operation per annum is $15 per telephone, the cost of operating a 500 telephone exchange in the same place does not show as much as $15 per telephone cost, but considerably less.

Q. Then if in the city of Washington, for instance, with an exchange of 100 subscribers, there will be a profit at the rate of $15 per year, your judgment would be that when the number of subscribers was increased to 4,000 or 5,000 it could be done at a profit at a good deal less than $15 per year. Is that so? A. My judgment is that in the city of Washington, now using 3,000 telephones, if it costs $30 per annum to operate
1434 them, with 5,000 telephones or 4,000 telephones in a telephone exchange in the city of Washington, the cost would not exceed $25 per telephone for said 4,000 or 5,000 telephones.

Q. I repeat my question and ask for an answer to it.

The question was repeated as follows:

Q. Then if in the city of Washington, for instance, with an exchange of 100 subscribers there will be a profit at the rate of $15 per year, your judgment would be that when the number of subscribers was increased to 4,000 or 5,000 it could be done at a profit at a good deal less than $15 per year. Is that so?

Please answer that question.

A. My judgment is that in the city of Washington if a telephone exchange involving 100 subscribers connected such sub-

scribers as could reasonably be expected to be connected in a telephone exchange in Washington for public purposes of 100 telephones profitably at $15 per annum, the same might be increased to 4,000 or 5,000 at a profit. I would like to add to that that it is contemplated by this answer that the character and gender of the service and subscribers would be alike, as is usual in the course of a telephone exchange.

Q. What is your judgment as to whether telephone service can be rendered as cheaply per subscriber in a large city like Washington or Chicago as in one of the small towns to which you have been referring, where they have 100 or 200 subscribers and charge $15 per annum for business telephones and
1435 make a profit? A. No, sir; I do not believe in the city of Washington the service can be given as cheaply as I have related was being furnished small towns at a very low rate, $15 or less.

Q. Have you in your testimony in this case stated all the elements that entered into your estimate of the cost per telephone for furnishing service in Washington. If you have omitted any, please give them to us now. A. I do not recall any elements at this time that I can furnish.

Q. Who was it told you that the president of the defendant company received a salary of $25,000? A. I have forgotten.

Q. Have you here and readily accessible a blue print showing the construction of your switchboard at Newark, New Jersey? A. No, sir.

Q. Have you anywhere such a blue print? A. We have made blue prints of it. Whether they are here or not I could not say. We are very careful about our blue prints, and they may be in the hands of an expert, or they may be in the department.

Redirect examination.

By Mr. BIRNEY:

Q. Since you were examined this morning respecting the switchboards removed from Kalamazoo, Michigan, to Decatur, Illinois, have you communicated by telegraph with the Telephone Company at Decatur, using those boards? A. Yes, sir.

1436 Q. Will you produce a telegram that you sent them? A. This (indicating) is a duplicate of a telegram or the original of the carbon copy of the telegram, sent to them.

Mr. BIRNEY: I offer in evidence the telegram produced by the witness.

Mr. WORTHINGTON: We object to this paper on the ground that the information acquired in this way and at this time is

not competent evidence; that the telegram without the reply amounts to nothing, and that if the reply is offered in connection with it, it amounts simply to hearsay unsworn testimony by some witness whom we have no opportunity to cross-examine.

The above-mentioned telegram is as follows:

"January 19, 1899.

"To Citizens' Telephone Co., Decatur, Ill.:

"Are our switchboards in use there furnishing you reasonably satisfactory service? Please answer; important to me personally to have your advice.

"JAMES E. KEELYN, President."

By Mr. BIRNEY:

Q. Have you received an answer to that telegram? A. Yes, sir.

Q. Please produce it. A. This (indicating) is the answer which I received to the telegram sent as above.

1437 Mr. BIRNEY: The answer produced by the witness is offered in evidence, and the examiner is requested to copy it into the record.

Mr. WORTHINGTON: We object to the answer on the ground that it is an attempt to introduce statements of a third person who is not sworn nor present for cross-examination, and for the additional reason that it does not appear who signed the telegram or what means of information he had.

The said telegram is as follows:

"Decatur, Illinois, January 19th, 1899.

"Western Telephone Construction Co., Chicago:

"Your switchboards are reasonably satisfactory.

"CITIZENS' NATL. TEL. CO."

By Mr. BIRNEY:

Q. Please look at the letter now shown you, and state what it is and how your company received it, if it did receive it? A. This is a letter received from the Southern States Telephone Co., of Norfolk, Va.

Q. When was it received? A. Under date of October 20th, the letter being dated October 18th, 1898.

Q. Was it received by mail? A. By mail, regularly in the course of our business.

Q. Whose signature is signed to it? A. Mr. William Pannill, superintendent.

Q. Who is he? A. He is the superintendent. I recognize his signature.

1438 Mr. BIRNEY: The letter identified by the witness is offered in evidence and the examiner is requested to copy it into the record.

The letter is as follows:

"Southern States Telephone Co.,
"254 Main Street, Norfolk, Va.,
"October 18th, 1898.

"Western Tel. Con. Co., Chicago, Ill.:

"Gentlemen—We send you under a separate cover photograph of our operating room in Norfolk. You will notice over each case we have buzzers instead of signal lights.

"Any time you desire to send prospective purchasers to examine our plant, with a view of establishing a similar one, they will find that we have the most perfect and successful independent telephone plant in this country. Very truly,

"S. S. TEL. CO.,
"WILLIAM PENNILL, Supt."

Mr. WORTHINGTON: In view of our cross-examination of this witness in reference to the Norfolk exchange, we make no objection to this letter, except the general objection which we have made to any evidence relating to operations of exchanges in other cities.

JAMES E. KEELYN,
By the Examiner, by consent.

1439 Subscribed and sworn to before me, this —— day of ——, 1899. ——— ———,
Examiner in Chancery.

At this point a recess was taken until 8 p. m. of the same day at Room 6, Auditorium Hotel.

1440 Room 1,708, Auditorium Hotel, Chicago, Ill.,
Jan. 19, 1899, 8:00 o'clock p. m.

Met pursuant to adjournment at the Auditorium Hotel, Chicago, Ill.

Present on behalf of the complainants, Mr. Birney.
Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

HENRY P. CLAUSEN, a witness of lawful age, called by and on behalf of the complainants, is examined:

By Mr. BIRNEY:

Q. Please state your age, residence and occupation? A. 28 years; 1295 Rokeby street, Lake View, Chicago; electrician, with Western Telephone Construction Company.

Q. What part of the business of the Western Telephone Construction Company do you particularly give attention to? A. The engineering department, as it is called.

Q. And to what part of the apparatus? A. All telephones and switchboards, and in fact any apparatus sent out by the company passed through the department under my charge; and all plans, specifications and, in certain cases, new devices are prepared under my direction by draughtsmen in the employ of the Western Telephone Construction Company.

Q. How long have you been engaged in electrical work as an electrician? A. Actively in electric work since 1888,
1441 approximately.

Q. And how long in electrical telephone work? A. Telephone work since about 1892, I believe—that is, actively.

Q. Do you read German? A. I do.

Q. Do you know a paper published in Berlin, Germany, known as the Elektro Technische Zeitschrift? A. Yes, sir.

Q. Are you a subscriber to that paper? A. I am.

Q. What is the general scope and purpose of that paper? A. The paper is published for the purpose of giving subscribers a general idea of the general progress of electrical work; and what is of interest to me is that it publishes quite a little matter referring to telephony.

Q. The purpose is, I take it, from its name, to give electrical news? A. Electrical news in general.

Q. How long have you been a subscriber to that paper? A. I have been a subscriber to that paper since January, 1898.

Q. Do you know who are the editors and publishers? A. One of the editors is Julius Springer. I believe his name is Julius. I am not positive, though; and a letter received
1442 from Julius West seems to indicate that Mr. West is the owner of the paper, in as much as he expresses it in a way to say "my paper."

Q. Where is the paper published? A. Berlin, Germany.

Q. Do you know what standing Mr. West and Mr. Springer have in the electrical world? A. From all I have heard of them, Mr. West especially, he has been mostly interested in telephone work, probably if not positively connected with the German Postoffice system, which is controlled by the Government.

Q. Have you the issue of that paper of the 6th of January, 1898? A. I have.

(Witness produces paper above referred to.)

Counsel for complainants now offers for identification the article in the above mentioned paper headed "New York Telephone Company," and especially the tables accompanying that article, with the purpose of offering it hereafter in evidence,

with the translation to be hereafter made by some competent person.

The article referred to, together with the translation thereof, is appended hereto, marked "Clausen, No. 1."

By Mr. BIRNEY:

Q. Mr. Clausen, have you had occasion in your work as an electrician to determine the advantages and disadvantages of the use of one switchboard or of two or three in any
1443 given locality? State what investigations you have made upon that subject. A. The matter has come up many times whether the switchboard should be built for a capacity sufficiently large to give service to all the subscribers of a city; and, as a rule, I have found, and others have found—

Mr. WORTHINGTON: I object to the witness stating what others have found.

A. I have found that it was advisable in—

By Mr. BIRNEY:

Q. You have answered my question. State what investigations you have made for the purpose of informing yourself upon this subject, either by reading or inquiry or practical experience? A. By gathering from personal experience and through statistics, gained from a close attention to all matters published in reference to the question.

Q. Please state if you will as a result of your investigation and experience what conclusions you have reached as to the advisability of the use of one or more switchboards in any one place? A. When plans are being made for installing a telephone system, the first thing would be to determine the general lay-out, so to speak, of the city to be supplied with telephone service. If the city is confined to a very small district it generally proves advisable to connect all of the telephone circuits to some centrally located point, which, of course, would
1444 then become the location for a switchboard. If, however, on investigation, it proves that the city were divided into several business districts, considerable distances apart, it would then be advisable to install a switchboard in those places where the subscribers telephone stations might be reached with the shortest average length of line per circuit; tht is to say, with two business districts, say two miles distant from each other, it would, to my mind be the best plan to install two exchanges and connect them by that number of wires which might be required for giving service between the two business districts. The same idea would be followed out where these same two business districts would form the

natural centers for resident districts and if these resident districts were several miles, say, away from the main exchange or main exchanges, it would be advisable to install a small switchobard or central office in these districts, and connect them to the main exchanges by a number of wires which would be determined by the amount of inter-communication between the residence telephone district and the business districts.

Q. Which would be the more costly to construct and set up; one large switchboard, say of three thousand capacity, or three small switchboards, of one thousand capacity each? A. That would depend somewhat upon what type of switchboard should be installed.

Cross-examination.

By Mr. WORTHINGTON:

1445 Q. When you say it is advisable under certain circumstances, which you have described, to have more than one exchange, do you mean advisable from an economical point of view? A. Under certain conditions; yes.

Q. Do you mean that it would be an advantage in any other respect than in a saving of the cost of plant? A. It would be an advantage with a certain class of switchboards, to divide the exchanges.

Q. What class of switchboards? A. Multiple switchboards.

Q. Why? A. Multiple switchboards would, if divided into several exchanges, reduce the cost of building the switchboard proper, where, if the several switchboards had to be combined into one exchange and operated as multiple boards are, the cost would not necessarily be double that of the smallest of the two smaller exchanges; but, adding the additional cost of connecting the telephone circuits to such a large exchange, would probably bring up the total cost to double that of what it would be with the two exchanges divided.

Q. I understand that you think this division into several exchanges would be better because the cost would be less,

1446 but my question is whether there is any other reason why it is better to have several exchanges instead of one. A. Another reason would be if there are several exchanges, a fire or other accident which would disable one of the exchanges would not necessarily disable the others, which would be the case if that exchange were destroyed which gives service to all telephone circuits of a given city.

Q. The more exchanges you have the more liability to have a serious loss from fire in exchanges; is not that so? A. And the more chance you have to meet any emergency that might arise in the destroying of a given exchange.

Q. You are still talking economy. I want to know whether there is any other reason for dividing subscribers around among a number of exchanges instead of having them all center in one. A. The question is rather hard to answer, because an answer would involve always that it is more economical.

Q. That answers my question. In the multiple switchboard in a single exchange, how many operators are employed in receiving a call and connecting the calling subscriber with the subscriber wanted? A. In the earlier types of multiple switchboards, one; in the later types, two, and sometimes three.

Q. What companies manufacture and what companies use what you have described as the latest type of multiple switchboards? A. The Western Electric Company, as I gather
1447 from statistics, manufacture switchboards of that class, and the New York Telephone Company use it.

Q. In what exchange or exchanges? A. The New York Telephone Company use this new type of the multiple system, if my memory serves me right, in the John Street Exchange.

Q. Any other? A. I am not aware of it.

Q. Then, so far as you know, what you have called the later type of multiple switchboard is a single switchboard in use by one of the exchanges in New York City. Is that correct? A. It is, as regards the statistical evidence I have of the fact.

Q. What other evidence have you, aside from what you call statistical evidence, that such a multiple switchboard has been used recently? A. I have not had occasion to examine the switchboard that I have described.

Q. Do you know, Mr. Clausen, that in the John street switchboard one operator receives the call and puts the calling subscriber into communication with the subscriber who is wanted, except in cases where the subscriber called connects with another exchange, as in Brooklyn, and communication being the subject of a toll charge, and that the purpose of having another operator in such a case is to keep a record
1448 of the toll charges against the respective subscribers? A. I am not aware of the latter part of your question, but I am aware that the calls are outgoing from the John Street Exchange, and I believe that while incoming they are answered direct by this second operator.

Q. Do you not know that in that exchange, wherever the called and calling subscriber are both connected directly with that exchange, so that there is no toll charge, one operator receives the call and completes the communication? A. The connections are made direct as regards that particular exchange; but I do not understand that there are any toll charges over the trunks or circuits, connecting, as they do, to other parts of the city.

Q. Do you undertake to say that even where the subscriber who called up the John Street Exchange, being connected with it, desired a communication with a subscriber in another exchange over which there is no toll charge, two operators at the John Street Exchange participate in making the connection between the subscribers? A. No, sir; one operator, as I understand it.

Q. One operator there and one in the exchange called for? A. Yes; that is the way I understand it.

Q. What difference is there in the operation of that John Street switchboard in New York from other multiple boards when the making of the communication does not in-
1449 volve a toll charge? A. In that part, I see no particular difference.

Q. Do you think a single multiple board for three thousand subscribers is more expensive than three such boards for one thousand subscribers each? A. The cost of the three switchboards certainly would exceed the cost of one of three thousand capacity.

Q. With three exchanges in the same city, how many trunk lines would there be established in communication between them? I do not mean the number of cables, but the number of lines. A. That would depend entirely on local conditions.

Q. Would you not have one trunk line from each of the exchanges to each of the other two? A. Yes; one or more, as the service demanded.

Q. I am not speaking of cables, but of trunk lines. Would not each exchange have to be connected with each of the others? A. By trunk lines; yes.

Q. Then with three exchanges you would have three trunk lines, would you not? A. You would have three sets of trunk lines.

Q. With four exchanges in the same city, how many sets of trunk lines would you have? A. You would have six sets of trunk lines.

Q. With five exchanges, how many sets of trunk lines
1450 would you have? A. With five exchanges you would have nine sets of trunk lines.

Q. Suppose that in a city the business district is practically a continuous one, about two miles in length and, say a mile in width, and it had, say, two thousand subscribers. How would you divide that district up into exchanges? A. If the business district was practically continuous, it would appear that one exchange should give good service from a practical and economical standpoint.

Q. You stated, as I understand you, that your conclusions as to the advisability of several exchanges in a city instead of

one have been reached partly from close attention to all publications upon that subject. Is that correct? A. All publications that I obtained and had access to.

Q. What publications have you had access to on that subject? A. One of the most recent publications is a report from the University of Wisconsin, where Mr. A. V. Abbott makes a statement that it is more economical to operate divided exchanges than to build a large central office equipment; that is, if my memory serves me right in all of the details.

Q. Is that report in print? A. It is in a regular publication.

Q. What publication? A. A publication issued by
1451 the faculty of the University of Wisconsin.

Q. When? A. I have the copy with me, but I did not understand it would be offered in evidence. (After examining paper.) October, 1894.

The witness here produces and hands to the counsel for defendant for their examination a printed document, entitled "Bulletin, University of Wisconsin, Engineering Series, volume 1, No. 4, pages 69-100, Pls. 1-4, The Evolution of a Switchboard, by Arthur Vaughn Abbott, C. E., and published by authority of law and with the authority of the regents of the University, October, 1894."

By Mr. WORTHINGTON:

Q. Upon what other publication of this character do you base your conclusions? A. I do not remember which.

Q. Are you sure there is any other publication upon this particular point? A. I think so.

Q. That you have consulted? A. I think so.

Q. But you cannot remember what they are? A. I cannot remember what they are.

Q. What is your experience in this business of the advantage of dividing cities into exchange districts instead of having
1452 one central station? A. The experience has been derived from my being in close touch with the systems prepared under my charge, and investigations of a personal nature.

Q. Has your reading enabled you to tell us what is the tendency in Europe as to the consolidation of subscribers into one exchange or dividing them around among several, in Paris, for instance? A. I am not prepared to answer that question.

Q. Do you not know that a multiple switchboard has recently been constructed and put in operation in Paris in which there are ten thousand subscribers connected with the same switchboard? A. No, sir; I was not aware of that.

Q. Are you aware of the fact that within a few months there has been installed in the city of St. Louis a single switchboard

for a system of six thousand or more subscribers? A. I remember noticing a reference to a large switchboard being installed, but I do not remember the particulars.

Q. Do I understand you to say that this article of Prof. Abbott, published by the University of Wisconsin, advocates the plan of dividing cities into several exchanges, instead of having the subscribers concentrated on one switchboard? A. As I remember the general trend of the subject I believe that is right.

Q. I will ask you whether this article does not simply describe the early switchboards which preceded the multi-
1453 ple switchboards, and if it does not, then, on page 82, contain the following language:

"An attempt to economize the labor required by and improve the service given on the standard switchboard, gave rise to the invention of the famous multiple switchboard, now almost exclusively adopted in all exchanges of magnitude."

And whether the article does not then proceed to describe in detail the multiple switchboard and its operation, and then whether the article does not conclude with this paragraph:

"Such is the switchboard apparatus of the present, but what is to be the board of the future? Some prophetic experts predict enormous multiple exchanges, the subscribers of which may be counted by tens of thousands; to other eyes the exchanges of the future are composed of divided boards scattered through a lot of little offices. Possibly dormant in the brain of some embryo electrical engineer is the germ of invention, the development of which will consign all the present types to oblivion and place the service on planes of excellence yet undreamed of. Gentlemen of the University of Wisconsin, to you this gate stands ajar; and, though like the portal of old, the gateway be narrow and straight be the way, and few there be that find it, yet remember that always within the grasp of patience and industry hangs the laurel wreath of success."

A. The quotations appear to be the beginning and end of a number of conclusions by Mr. Abbott which have not
1454 been quoted, and which would, I believe, substantiate some of my previous statements.

Q. I now hand you the article and ask you to find in it a paragraph or a sentence which in any way advocates or tends to show the advantage of a number of exchanges over one in the same city; and if you will find such passages I will read them as a part of the record of this case, and humbly apologize for my error. A. I have not made any quotation marks or anything that would enable me to find the passage in question quickly, but I suppose it could be found.

Q. I observe that counsel for the complainants is looking

through the book, and I will agree that he may aid you in the search, and I will also read any part of the article which he thinks may contain your view of it.

(Counsel for the complainants now handed the book to the witness, who proceeds to examine the same.)

Mr. BIRNEY: Counsel for complainants states that he has not seen the book until handed him about one minute ago by counsel for the defendant, in whose possession it was until that time, and that he has had no opportunity whatever to read it.

The WITNESS (after examining the book): I have found two pages of it there that refer to the subject. Pages 94 and 95, I believe, embrace a number of the conclusion and statements made by Mr. Abbott. I believe that this passage which I have marked on page 97 should also be read, and possibly the
1455 plates referred to on those pages should go with it.

Counsel for the defendant having read pages 94 and 95 of the article, and the sentence on page 97 indicated by the witness, states that in his opinion there is in them no such expression of opinion on the part of the author as sustains the witness's view of the matter, and he therefore declines to read them in evidence as a part of his cross-examination; but in fairness to the witness he suggests that by consent of counsel they be copied into the record.

The extracts above referred to are as follows:

"Telephonic service has thus far been considered under the assumption that all the subscribers in any district are brought to a single office. Where a large amount of territory is covered and the subscribers are widely scattered the necessary plant of cable or aerial lines which is required to bring all the subscribers to the central exchange become of great magnitude. As only a small percentage of the entire number of subscribers will be in conversation at any one time, economy in construction may frequently be introduced by splitting the territory into a number of districts, in each one of which an office of sufficient capacity to handle the immediate territory is located, while all the various exchanges are interconnected by a relatively small number of trunk lines; thus the wire mileage to serve a large territory may be reduced to a minimum.
1456 The operating expenses are necessarily increased, as separate buildings have to be provided for the smaller exchanges, requiring a greater amount of attendance, maintenance and supervision than is necessary when the territory is served from a single office. To offset this expense the expense of installing the smaller exchanges is very much less than that required for large offices, with a corresponding reduction in the

interest and depreciation account. It has been shown that for an office of 10,000 subscribers on the multiple board system nearly sixty jacks were required for each subscriber or 600,000 jacks for the entire exchange, exclusive of trunk lines, provided the same number of subscribers were distributed among ten offices, of one thousand lines each, only ninety thousand jacks would be required, thus reducing the expense of installation in nearly the same proportion. Telephonic service is thus seen to fall under the same general economy laws that affect all electrical transmission problems, and which are so clearly enunciated by Lord Kelvin. In laying out an exchange consisting of several offices it becomes necessary to consider the interest and depreciation upon the cost of the plant involved in one large central station, in comparison with the increased cost of maintenance of a number of small ones. The problem is still further complicated when a consideration of the kind of business to be done by each office is made. The growth of telephonic service is usually centrifugal. The first exchange being located near the centre of the business district of the
1457 city around which the residence portion, at constantly increasing distances, are located. The service is at first confined to more important houses which desire to have communication with each other. From this as a centre the business of the company gradually radiates to the lesser business houses and then to the residence districts. When the territory is split up into a number of subdivisions the outlying offices usually embrace a large proportion of residences, where the number of calls per subscriber is comparatively small. Consideration indicates that the business from the outlying districts will divide itself into two kinds—one portion comprising local calls among the subscribers to the branch exchange, while the other portion is a through business originating with the subscribers of the branch exchange, but transmitted into the main office. A multiple board introduced into the branch exchange becomes of little use, as the greater proportion of the calls originating in the exchange are trunked to the central district, and the multiple portion of the local board is comparatively idle. To meet this service condition it has recently been considered advisable to divide the functions of the operator by so designing the board that the calls originating in any exchange may be received on one part of the board provided the enunciators and with trunk line jacks to branch exchanges, while another part of the board is supplied with a small number of multiple sections into which the local subscribers
1458 are wired in the usual manner, thus splitting both the switchboard and the functions of operating into two parts."

* * * * * * * * *

"To a certain extent this is true, and if the business done by the exchange is largely a local one, the divided switchboard entails considerable additional operating expense; but where the business of the exchange is largely trunked to other offices experience has shown that the divided switchboard forms not only a more economical method of operation, but calls for a very much smaller investment of original capital."

Redirect examination.

By Mr. BIRNEY:

Q. Mr. Clausen, I observe that in responding to the question touching the number of trunk lines between five supposed exchange stations, you drew a diagram so that you might count the trunk lines. Please look at your diagram again and count them. A. If I made my answer nine, I made the mistake of counting nine instead of ten. It should be ten.

Recross-examination.

By Mr. WORTHINGTON:

Q. If you had six exchanges, how many trunk lines
1459 would you have?

Mr. BIRNEY: That is objected to as not matter in surrebuttal.

A. It is a matter of figuring it out on paper. Thirteen, I make it.

Q. Please count that again and see if it is not fifteen? A. Yes, sir; it should be fifteen.

HENRY P. CLAUSEN,
By the Examiner, by consent.

Subscribed and sworn to before me, this —— day of ———, 1899.

———— ————,
Examiner in Chancery.

The further taking of these depositions was thereupon adjourned until Friday, January 20, 1899, at Fort Wayne, Indiana.

1460 Office of the Home Telephone and Telegraph Co.,

Fort Wayne, Ind., January 20, 1899, 4 o'clock P. M.

Met pursuant to adjournment at the office of the Home Telephone and Telegraph Company, Fort Wayne, Indiana.

On behalf of the complainants, Mr. BIRNEY.
Present on behalf of the defendant, Mr. WILSON and Mr. WORTHINGTON.

THEODORE THORWALD, a witness of lawful age, called by and on behalf of the complainants, having been first duly sworn, is examined.

By Mr. BIRNEY:

Q. State your age and place of residence, if you please. A. 41 years old; Fort Wayne, Indiana.

Q. And your occupation? A. I am at present and have been managing the Home Telephone and Telegraph Company.

Q. How long have you been manager of the Home Telephone and Telegraph Company? A. One year and a half.

Q. Is that company engaged in giving telephone exchange service to subscribers in Fort Wayne and vicinity? A. Yes, sir; in Fort Wayne. I don't know about the vicinity.

1461 We have lines, toll lines outside, but they are not our own—the toll lines. We simply use the other lines.

Q. Your exchange system extends then to Fort Wayne, with a few outlying points, as I understand you? A. We have about from fifty to seventy-five towns in the neighborhood around that we connect with.

Q. Do you do that throgh your toll lines or through your exchange? A. Through both. The toll lines belong to the other companies—to the National Company, for instance—and we have an arrangement whereby we get a per cent of all the toll business that comes in and out to our exchange.

Q. As manager what has been and what are your duties? A. To have charge of the business in general, overseeing the operating room and the construction, and in regard to the service, and looking after the patrons, if there are any complaints, or anything—overseeing it in general, you know.

Q. Is the system in Fort Wayne overhead or underground, or both? A. Both.

Q. How much of underground conduit work have you? A. I think we have about two miles of conduit. That is, straight trench.

Q. And how many duct miles have you? A. They average about four ducts to the mile in that way. In some places they

are eight and ten and then in some places two ducts—you might say three ducts, but one of them belongs to the
1462 city, but only two ducts belong to us. Wherever we go, we have got to give the city one of them.

Q. What is the material out of which the ducts are made, and how are they laid? A. We got the ducts from Van Camp & Co., of Ohio. We first put concrete down and then the ducts on that, leaving about four inches space on each side in the trench for concrete, and then covered them up again with about six inches of concrete, I think. That is the manner in which they are laid. Of course they vary some, according to the streets, but that is about the general way of it.

Q. Can you state how many telephones are in use in your system? A. Yes; the last report, which was made at the end of December, shows 1,624.

Q. And how many had you in use on the 1st day of January, 1898? A. I think the increase was about three hundred. It may vary five or ten either way, so there would be about 1319 or 1320 at that time.

Q. Of these 1624 telephones in use at your last report, as you state, how many were business telephones and how many were residence telephones, if you can divide them up in that way? A. I can tell you better by taking the report.

Q. All right; take the report. Please state the num-
1463 ber of telephones of the different classes making up the 1624 of which you have spoken, with the prices charged by your company to the subscribers for each class per annum. A. There is five at $42 per annum. That is business. There is three at $40, 552 at $36, 5 at $30, 261 at $24, 107 at $18, 16 at $13.50 per annum, and 636 at $12. Then there are 39 that are what we call dead heads, such as city offices and others we have to give, under the franchise.

Q. At what point in the enumeration do you draw the line between business houses and residences? A. Everything above $24 is business.

Q. How about those at $24? A. They are residence telephones, with no business connections.

Q. Please explain why the larger number of the business telephones are $36, and some appear to be charged for a higher price? A. The regular business rate is $36. About a year ago a representative of Ericson people came along and sold our folks 10 Ericson desk sets, and the board of directors realized that they did not dare to give them at the same rate as the common telephone, so they made the different rate, because everybody wanted those telephones in.

Q. To return again to the size of your system. How many poles have you in your overhead system? A. We have about 1200.

Q. How many miles of overhead wire? A. That
1464 would be about 35 poles to the mile, and it would be about forty miles of wire, taking it if it was single; but of course in some places we have as high as fifty lines on a string of poles.

Q. It is 40 miles in lineal extent? A. Yes.

Q. In the course of the performance of your duty as manager, do you make up monthly reports of the business? A. Yes, sir. That is, I do not make them up, but I look over them and look at them and compare them and things like that.

Q. As a result of those monthly reports was a yearly report of business made at the end of December last? A. There was a report made the first of October, that being the annual time from the time we commenced. The report always runs from one October to the other.

Q. Does that report set out all the business of the company? A. Yes, sir.

Q. During what period of time—during the past year? A. Yes, sir; complete.

Q. Have you got that report here—the annual report of October 1st, 1898? A. It is in the office.

Q. Have you here present the monthly reports of all the months in the year 1898 of which you have spoken? A. I have a copy of all of them except one of them is copied in the
1465 books, the one for the month of August. It seems that has been mislaid, but it is copied in the books.

Q. Reports from what period? A. From the 1st of January, 1898, to the 31st of December, 1898.

Q. Into what detail do these monthly reports of yours go? A. They go into detail of everything—of the whole business of the month. If you want it from the 1st of October to the 1st of January here are those three months. (Witness produces three reports).

Q. Do your reports run from the 1st of October or the 31st of October? A. The 1st of October.

(Witness produces reports from the 1st of October, 1897, to the 31st of December, 1898).

By Mr. BIRNEY:

Q. These reports are made up under your direction, you say? A. Yes, sir.

Q. Are they correct statements of the business done by the company during that period? A. Yes, sir.

Q. And was it from those that the annual report submitted on the 1st of October, 1898, was made up? A. These are put into the book at the end of each month, the different items, and then the annual report is made up out of that.

1466 Q. Out of the book? A. Yes, sir.

Q. That October statement was made up for whom? A. For the stockholders. First, for the Board of Directors, and then for the stockholders, through them.

(Witness here tenders for the inspection of counsel for the defendant the detailed monthly reports referred to, from the 1st of October, 1897, to the 31st of December, 1898, except the one for the month of August, 1898, which the witness states has been mislaid.)

By Mr. BIRNEY:

Q. Have you here present the official annual report of October 1st, 1898? A. Yes, sir.

(Witness here produces the book referred to, containing said annual report, beginning at page 38 and ending on page 40, it being a report to the stockholders.)

By Mr. BIRNEY:

Q. What is Exhibit "A" on page 41 of this book? A. A trial balance.

Q. Have you examined this trial balance, Exhibit "A," on page 41? A. Yes, sir.

Q. Is that a correct compilation of the business of the company during the period referred to? A. Yes, sir. There is the report of the auditing committee that went all over it.

1467 Q. With this trial balance before you and this annual report, will you please state what were the total receipts from the exchange business of the company for that year? A. $32,674.92, including $1,300.90 toll receipts.

Mr. BIRNEY: I offer in evidence the annual report above identified by the witness, and request that the same may be copied into the record by the examiner.

The paper above referred to is as follows:

The Chairman then received report of Auditing Committee, which was accepted, and upon motion ordered to be spread on the minutes, as follows:

To the Stockholders of the Home Telephone and Telegraph Company:

We the undersigned committee appointed to examine and audit the books of this company herewith report.

We have carefully examined all the books found in office; we have checked all vouchers and bills with entries made in the ledger and journal and found them correct.

Exhibits "A," "B," "C" and "D" are filed herewith and incorporated as part of this report.

Each exhibit gives a detailed statement of the transactions of the company during the past year.

Exhibit "A" consists of the "Trial Balance."

Exhibit "B," details of the earnings and expenses.

Exhibit "C," profit and loss account.

Exhibit "D" comprises the "Assets and Liabilities."

1468 Exhibit "B" shows that the earnings of the company were $32,674.92, operating expenses $17,846.85, making the net earnings $14,828.07, out of which were paid in dividends and interest $10,793.54.

The cash on hand Sept. 30th amounts to $3,699.84, which has been verified by an examination of the treasurer's accounts at the Hamilton National Bank. There has been a gain during the year of two hundred and seventy-eight telephones, making a total of 1,558 in operation Sept. 30, 1898.

The books of the company appear to be kept in a systematic manner and in a way which should be satisfactory to all stockholders.

E. W. COOK,
J. B. FRANKE,
L. C. HUNTER.

Meeting then adjourned.

1469

"Exhibit A."

Trial Balance.

Telephone earnings	2,167.65	Capital stock	125,000.00
Soliciting	17.00	Exchange rentals	31,075.02
Gen. Office	1,738.27	Toll receipts	1,300.90
Commission	617.80	Mdse.	299.00
Rent	547.00	P. & L.	721.02
Advertising	328.80	Bonds	125,000.00
Toll earnings	239.75	Whitman & Couch	1.65
Operating	5,117.56		
Light, fuel and power	439.31		
Expense	977.69		
Stationery	237.04		
Insurance	337.50		
Freight and drayage	194.82		
Maint. Lines	976.24		
Postage	55.00		
Telephone directories	292.40		
Western Tel. Const. Co.	10.00		
Water rent	12.45		
Maint. S. Board	867.74		
Tools	162.29		
Furniture	324.58		
Mess. fees	68.65		
Plant	247,748.33		
Maint. 'phones	1,891.84		
1470 Fisher Bros.	40.00		
Shell & Co.	40.00		
W. J. Vesey	14.00		
J. K. Wheelock	40.00		
Schone & Welth	2.50		
Western Gas Coast Co.	124.00		
Chief Fire Department	2.96		
Rev. L. L. Henson	3.50		
Dr. F. M. Porter	13.50		
Tri. State B. & L. Asstn.	17.50		
Dr. M. I. Rosenthal	3.50		
L. M. Hartman	3.50		
Nat. Tel. & Telg. Co.	31.36		
Dr. A. E. Bulson	6.10		
Rorode Dry Goods store	13.00		
Books and collections	1,721.24		
Petty account	30.00		
Dividends	4,823.10		
Interest	5,970.44		
Jenny Elec. L. & P. Co.	27.75		
Pole tax	1,378.50		
C. L. Olds Const. Co.	21.54		
Cash on hand	3,699.84		
	283,397.59		283,397.59

1471 "EXHIBIT B."

Earnings for fiscal year ending Sept. 30th, 1898		31,075.02
Toll receipts		1,300.90
From other sources		299.00
		$32,674.92
Operating expense as follows:		
Soliciting	17.00	
Gen. Office	1,738.27	
Commission	617.80	
Rent	547.00	
Advertising	328.80	
Operating	5,117.53	
Light & Fuel & Power	439.31	
Expense	977.69	
Stationery	237.04	
Insurance	337.50	
Frt. & Drayage	194.82	
Maint. Lines	976.24	
Postage	55.00	
Telephone directories	292.40	
Water rent	12.45	
Maint. S. Board	867.74	
Mess. fees	68.65	
Maint. 'phones	1,891.84	
Books & collections	1,721.24	
1472 Petty account	30.00	
Pole tax	1,378.50	
	17,846.85	17,846.85
Net earnings		14,828.07

1473 "EXHIBIT C."

Profit and Loss Account.

Soliciting	17.00	Exchange rentals	31,075.02
Gen. Office	1,738.27	Toll receipts	1,300.90
Commission	617.80	Mdse.	299.00
Rent	547.00	P. & L.	721.02
Advertising	328.80		
Operating	5,117.56		
Light, fuel and power	439.31		
Expense	977.69		
Stationery	237.04		
Insurance	337.50		
Frt. and drayage	194.82		
Maint. Lines	976.24		
Postage	55.00		
Telephone directories	292.40		
Water rent	12.45		
Maint. S. Board	867.74		
Mess. fees	68.65		
Maint. 'phones	1,891.84		
Books and collections	1,721.24		
Petty account	30.00		
Dividends	4,823.10		
Interest	5,970.44		
Pole tax and county	1,378.50		
	28,640.39		
	4,755.55		33,395.94
	33,395.94		

1474 "EXHIBIT D."

Assets and Liabilities.

Telephone earnings	2,167.65	Capital stock	125,000.00
Toll earnings	239.75	Bonds	125,000.00
Western Tel. Const. Co.	10.00	Whitman & Couch	1.65
Tools	162.29	Undivided profits	4,755.55
Furniture	324.58		
Plant	247,748.38		
Acxts. rec.	355.42		
Jenney Elec. L. & P. Co.	27.75		
C. L. Olds Const. Co.	21.54		
Cash	3,699.84		
	254,757.20		254,757.20

1475 By Mr. BIRNEY:

Q. Were you a resident of Ft. Wayne before the Home Telephone and Telegraph Company commenced business? A. Yes, sir.

Q. Were there any receipts or expenditures, to your knowledge, which do not appear upon these accounts? A. No, sir,

Q. What was the total expense of the company, including operating maintenance, etc.? A. $17,846.85. That includes what we pay the toll operator. She gets $21 a month.

Q. The net earnings were how much? A. $14,828.07.

Q. Is there a rival company also operating a telephone ex-

change in the city of Detroit? A. They were here first. We are the rival people.

Q. There is another telephone exchange here? A. Yes; there is another telephone exchange here.

Q. Is that a licensee of the American Bell Telephone Company? A. It is the Central Union, commonly known as the Bell Company.

Q. Do you know what are its rates for business houses and for residences? A. Their rates are not very well established now, but the known rates are $24 per annum for business houses and residence telephone thrown in.

1476 Q. And where the residence has no business house, what is the rate? A. Last year they have not been collecting any, but the rate established was ten dollars.

Q. How large is the city of Fort Wayne? A. About fifty thousand.

Q. Are its streets paved? A. Yes; there are considerable of them paved now.

Q. In what way? With what pavement? A. About five or six are paved with asphalt and about half the rest with brick, and the other half with block; but they are gradually being changed. Wherever the block run out, they put in brick.

Q. Do you mean wood block or Nicholson? A. Wood block.

Mr. WORTHINGTON: You say that is being run in.

A. No; that is being run out. Brick and asphalt are taking its place. Last year they used all asphalt.

By Mr. BIRNEY:

Q. Are there any electric railroads operated in this city? A. Yes, sir.

Q. How many different lines are there, or on how many streets do they run? A. It is one company. They have five different lines.

1477 Q. What is the capacity of the switchboard of your company, Mr. Thorwald? A. The capacity now—that is, those that are complete with jacks and everything, is 1,700; but the switchboard capacity, as far as the cabinet part is concerned, is 200 more.

Q. Making 1,900 as the ultimate capacity? A. Yes, sir.

Q. Who is the maker of the switchboard? A. The Western Telephone Construction Company of Chicago.

Q. What do you say as to whether or not the switchboard gives efficient service? A. The switchboard is giving good service. I do not mean by that that it gives as good service as any other board could give, but it is giving satisfactory service.

Q. Do you render a metallic circuit service to your subscribers or not? If so, to what extent? A. Not quite one-half are metallic.

Q. And the others are what? A. Common return.

Q. What is the general character of the telephone you use? A. The business telephones have all been changed into the long distance or what they call the Western Giant telephone with rocker arm.

Q. What other types have you in use? A. The other is what we call the common telephone. They are good telephones, only they have the common transmitter on. They have not
1478 quite as high an induction coil as what the rocker arm has.

Q. Have you calculated the cost to this company per telephone for its exchange telephones during the last year, including operating and all other expenses? A. You can figure it out from the annual report. It is about twelve dollars a year, one dollar a month. The operating itself at the operating room is thirty cents per telephone a month, and the reports divide it up in that way. Everything is shown there, the switchboard, how much it costs a year, and all the different things.

Q. What is the capital stock of the Home Telephone Company? A. $250,000 is the authorized stock. Issued up to this time, $125,000.

Q. Do you know its bonded indebtedness, if it has such? A. $125,000.

Mr. WORTHINGTON: Do you mean authorized or issued?

A. Issued.

By Mr. BIRNEY:

Q. What interest do the bonds bear? A. Six per cent, payable semi-annually.

Q. What dividends were declared and paid on the stock last year? A. Three per cent on the 1st of October, 1897, and three per cent on the 1st of April, 1898, in addition to the inter-
1479 est on the bonds.

Q. Was there any dividend paid after April, 1898? If so, how much? A. Yes, sir; three per cent on the 15th of October, 1898.

Q. Was the interest on the bonds paid? A. Yes, sir; the 1st of January.

Cross-examination.

By Mr. WORTHINGTON:

Q. Why have you not produced the annual report made October, 1897? A. I have not been asked for it.

Q. And the monthly reports leading up to it? A. I have not been asked for them.

Q. You have not been asked to produce those? A. I have not been asked here. You heard all the questions, and I have not been asked for it.

Q. How long has the *Home Telephone and Telegraph* Company been operating for service? A. Two years the first of October. This is the third year.

Q. Did it install the plant or take it from some other company? A. The Home Company took it from the Fort Wayne Company.

1480 Q. The Fort Wayne Telephone Company? A. Yes, sir.

Q. Was the plant completely constructed when it was transferred to the present company? A. It was completely constructed, as far as the amount of the telephones that they intended to put in at that time was concerned, but of course when more people came in they had to put more cable in and more switchboard capacity.

Q. Were you connected with the former company, the Fort Wayne Telephone Company? A. No, sir; I had nothing to do with that. I was not with that only as a stockholder.

Q. You were interested in it as a stockholder, then, were you? A. Yes, sir.

Q. A large one? A. One thousand dollars.

Q. What was the stock of that company issued at the time of the transfer? A. It was, I think, at that time $85,000.

Q. Do you know why it was that the Fort Wayne Telephone Company went out of business and transferred its plant to the Home Telephone and Telegraph Company? A. I do not know.

Q. Is there anybody about this office who does know, as far as your are aware? A. Nobody here but Mr. Moeller-

1481 ing, the secretary of the company.

Q. He was the secretary? A. No; he is the secretary now. He was not at that time.

Q. Is there anybody connected with this company who was connected with that company in an official way? A. No; not at this time.

Q. Has this company the custody of the books of the former company? A. I don't know.

Q. Is there anybody here who does know that? A. Not unless Mr. Moellering. He is the only official member here.

Q. Will you not inquire of him and find out? A. Yes; I will.

Q. And let us know whether the books of that former company are here.

(The witness left the room and subsequently returned.)

The WITNESS: Mr. Moellering says he has not got them. He was elected the 1st of December. That was after the annual stockholders' meeting. The new board elected him secretary of the Home Telephone and Telegraph Company.

Q. Who composed the board of directors of the old company at the time of the transfer? A. I don't know who the board was.

1482 Q. You do not know the names of the board of the company in which you were a stockholder? A. I paid no attention to it whatever at that time, because I never expected to be in this position. Some of my friends went into it, and said I should take some stock in it, and I took it.

Q. Will you tell us whether the minutes of the proceedings of the meetings of the board of directors of this company are here? Are they in the book you have produced? A. They are right there in the book.

Q. How far back does the book go which contains the annual report of 1898, which you have produced? A. That is October 12, 1898.

Q. That is when it begins? A. That is when this new book commences.

Q. Where is the book containing those minutes that precede this book? A. I think that is the book right there (pointing to a book on the desk).

Q. Please let us see it.

(Witness produces the book to which he has referred, and hands it to counsel for defendant to examine.)

In the book so produced and handed by the witness to counsel for defendant appears a resolution adopted by the board of directors of the Home Telephone and Telegraph Company, on the 2nd of December, 1896, reciting that the Home Tele-

1483 phone and Telegraph Company is the owner of a franchise for erecting and operating a telephone plant at Fort Wayne, Indiana; that that franchise had been, at the request of the Home Company, procured for it by and at the expense of the Fort Wayne Telephone Company; that the Home Company is the owner of a telephone subscription list at Fort Wayne of over 1,100 subscribers, which list was obtained for it by the Fort Wayne Company; that the Home Company is desirous of purchasing from the Fort Wayne Company its plant of not less than 1,100 telephones in said city; that the Home Company expects, from time to time, to increase its said subscription list and business, and is not now able to ascertain the exact number of subscribers or the extent to which it may extend its business; that the Fort Wayne Company now owns a telephone system in said city, and is willing to sell the same

and receive in payment therefor, as well as for its service already rendered and money so advanced, the Home Company's bonds and stock. After such recitals, said resolution declares that the president and secretary of the Home Company are authorized to enter into a contract with the Fort Wayne Company, carrying said proposed purchase into effect, and pay to the Fort Wayne Company, for said system, in settlement of the money so due, and payment for said franchise and subscription lists, the sum of $85,000 in the first mortgage bonds and $85,000 in the stock of said Home Company, the bonds to bear interest at the rate of six per centum per annum, payable semi-
1484 annually, and to be payable twenty years after their date.

Also a contract, dated the —— day of October, 1896, between said two companies, carrying into effect the transfer of said plant, in accordance with the terms of said resolution.

By Mr. WORTHINGTON:

Q. Has the Home Telephone and Telegraph Company had any financial transactions during the past year except those which are shown in the annual report of the auditing committee and the exhibits referred to therein, which have just been offered in evidence? A. No; there is nothing else. Everything is in there.

Q. Then please tell me from that book how much stock the company sold during the year, and what they received for it, and when the sale took place? A. $25,000.

Q. When did that sale take place? A. It was in the summer sometime; I guess in the month of June. They were sold at par.

Q. To whom? A. The arrangement was that all stockholders who wanted it could have it, and it was all taken by the stockholders.

Q. Were any bonds sold during the period from the 1st of October, 1897, to the 31st of December, 1898? A. Yes, sir.
1485 Q. How many, and at what rate? A. I did not have the sale of the bonds and stocks. I do not really know.

Q. Can you ascertain from an inspection of the books of the company in this office? A. I would rather leave that to the secretary. He has charge of that part of it.

Q. Do you decline to do it? A. How do you mean, decline to do it?

Mr. BIRNEY: Counsel for complainants here states, in view of the suggestion of counsel for defendant, that he will call the secretary of the company to the stand and take his testimony upon this subject.

By Mr. WORTHINGTON:

Q. Do you have anything to do with the keeping of the books of the company? A. No, sir.

Q. Do you have anything to do with directing the entries which are made in them? A. No, sir; I don't have anything to do with directing the entries.

Q. Do you know in what way the line is drawn between what is chargeable to construction and what is chargeable to maintenance, of your own knowledge? A. Yes; I know what the divisions are in it.

1486 Q. How do you know, Mr. Thorwald? A. I know in that regard what is charged up to the different parts, in order to know how much it costs to run the telephone, and I know what people are working at one part of it and what at another part, and what it is charged to.

Q. Tell us what entries are charged to maintenance and what to construction, and just where the line is drawn, clear through from beginning to end. A. If the batteries run out, and we put new batteries there, that is for the maintenance of the telephones. Then we have got a switchboard man who puts in his time to keep up the switchboard and do that work. That is charged up to the maintenance of the switchboard. That part that the operators do we charge that up to the operating expense. When any part of a telephone breaks, for instance, if a receiver gives out and we have to put in a new one there, that is charged to the maintenance of telephone. We keep everything separate in that way. If we get new telephones, for instance, if we buy ten new telephones today and put them in, we charge that to the plant. If we put up new lines tomorrow for those ten telephones, we put that down to plant account. If one party moves from one place to another place, and we take that telephone from that place to the other place, we put that down—the time those men put in—to maintenance of telephones, because it is maintenance of telephone service. That is the way we divide up the expenses.

1487 Q. If I understand you, when you install a telephone and its appurtenances in a new subscriber's place of business, you charge the entire expense to the plant to construction? A. To construction work.

Q. You do not charge any of it to maintenance? A. No; but the moment it is in there the time we spend on that, for instance, the inspector's work, inspecting the telephone, or the linemen going there and looking after the lines, or anything like that, that is charged to the maintenance of telephones.

Q. Do you know whether there is included in the expense of maintenance any allowance for depreciation? A. Yes; for instance, in the last year we changed all our business telephones

from common transmitters to the long distance, and of course those telephones in that way are better than they have been before, and that much has been allowed in that way for that.

Q. Did the new telephones cost more or less than the old ones? A. The new ones cost less this time.

Q. The long distance telephones cost more than the telephones they replaced? A. No; we buy the long distance now at about two dollars less than the telephones were when we started. We buy them now a dollar cheaper than we did a year ago, the same telephones, and they are better made, at that.

1488 Q. From whom do you buy the telephones? A. The Western Telephone Construction Company—that is, the majority of them. Desk sets we buy of the Stromberg-Carlston Company, of Chicago.

Q. Do you know how the cost of replacing the old telephones with the new long distance telephones was entered in the books in respect to maintenance and construction? A. My impression is that that is put down as maintenance of telephones. It was not charged to the plant.

Q. Do you know? A. I won't say that for sure. My impression is that it is what should be done, though.

Q. Do your reports show the number of subscribers on the list each month or year, and the number of new subscribers and the net gain? A. Yes, sir.

Q. How was that for the year ending September 30th, 1898? A. I have not got the amount that was taken out or the loss; but they are in the reports there. The report for every month shows what was taken out.

Q. You have not got that for the year except by going through the monthly reports? A. That is the only way I can give it.

Q. That you have not done? A. That I have not done.

1489 Q. Do you know when a subscriber gives up his telephone and it is taken out, what entry appears in the books about it and to what account? A. We make a record of the cable end of the lines and everything, and of course our construction people keep track of that, and they use that line again as soon as they can.

Q. Do you mean the old telephones are used somewhere else? A. They use them at other places.

Q. What about the wires and other appurtenances in the subscriber's place of business? Do you use them over again? A. We use the duplex over. We take the duplex out.

Q. What do you mean by the duplex? A. The line that runs into the building. We keep that line until we get somebody on that street again, and then we use that line again. Of course,

we may have to add something on to it or take somebody off. Of course, if the party that goes in happens to be this side of it, we get the telephone in at the same place, and there is not so much difference, either.

Q. If I understand you, in the first place, when you replaced some of your telephones with the new long distance instruments, you used all the old telephones? A. Yes, sir.

Q. You transferred them to some other subscriber. Is
1490 that right? A. We simply changed the transmitters on a good many of them—put long distance transmitters on.

At this point a recess was taken until 7o'clock p. m., at the same place.

After recess.

Cross-examination of Theodore Thorwald resumed.

By Mr. WORTHINGTON:

Q. What if any entry was made upon the books when a subscriber discontinued his connection with the telephone, his apparatus is taken out? A. We make a record of any telephones disconnected; and I told you in regard to it what record we make of the line so as to use it again. We use his telephone for somebody else.

Q. My question is what entry is made upon the books, if any, with reference to the loss which the companies sustain by losing the labor of putting up the plant in the retiring subscriber's place, and the labor of taking it out, and any material that may have been lost or depreciated in value in the transaction. A. We have our men to take care of the plant in general. Their time is put in. For instance, if I have to do a contract for a telephone, and at the same time have an order to take out a telephone, the man who puts that telephone in goes to this
1491 place and takes the telephone out and goes right over to the other place. It depends on how long he is walking from one place to the other to make that difference.

Q. My question is not about what is done, but what entry is made in the books. Do you know that of your own knowledge? A. Simply the entry is made that the telephone is taken out. There is no other entry made of it.

Q. That is the only entry, so far as you know? A. That is the only entry as far as I know.

Q. And every time a new telephone is installed, the expense attending that is charged to plant? A. Yes.

Q. Can you tell me how many subscribers the company has had from the start, including all those who have dropped out? A. No; I can't tell you that.

Q. Would that appear upon the books anywhere; do you know? A. The monthly reports will show that.

Q. You would have to have the monthly reports from the beginning and go through them? A. To show how many of them have been disconnected and put in and out.

Q. Was there a report to the company on or before the 1st day of October, 1897, similar to the one which has been
1492 produced here, dated October 1st, 1898? A. There is a report made to the stockholders every year. I suppose there was one made then?

Q. I would like to see the one made October, 1897. A. I don't know where it is, unless it is on the books, the same as this one is.

Q. Will you please look at the book and see if you can find the earlier report. A. I would rather wait a minute now, gentlemen. I don't like to have anything to do with the books. The secretary is in charge of the books.

Q. Is the secretary here? A. Yes, sir.

Q. Have you found in the book which has been produced here the report for October, 1897? A. It is in there.

Q. I would like to look at it. A. I ain't going to give up the book again. I would rather have him to do it.

Q. You say he is here? A. Yes; Mr. Moellering is here.

(Witness left the room and subsequently returned.)

The WITNESS: There is the report. It is not put up in quite as fine a style as the other one is. Well, I guess it is, too. I suppose they learn every year, and they change the form of it somewhat.

1493 (The witness now exhibits to counsel for the defendant the report of October, 1897, referred to, and counsel for defendant inspect the same.)

By Mr. WORTHINGTON:

Q. I find upon looking at this report made on the 1st of October, 1897, in the trial balance it appears that the company had issued bonds to the extent of $95,000. The statement on page 92, as to the total cash receipts of the company from all sources, is $30,266.24. Do you know whether it received, during that year, any money on account of the sale of bonds? A. I don't know. I was not with the company all that year in any capacity, so as to know that. During that year I wouldn't know as much about that part of it as I did during the last year.

Q. I find also on page 96, in another table, under the head of plant account, "bond sale, $5,000." Do you know whether that amount formed part of the $95,000 of bonds referred to on page 997? A. I don't know.

Q. Do you know how many bonds were sold that year and

what they did with the money? No; I don't know anything about that.

Q. Would these books enlighten you on that subject? A. I couldn't say how close they kept those items in there. I didn't have any particular charge of it in that way at that time.

1494 Q. Do you know of any special reason existing why the Home Telephone and Telegraph Company should have the advantage of the rival company known as the Central Union in respect of its opportunities and facilities, in regard to its right to erect telephone poles and wires and lay conduits in certain parts of the city? A. I would rather not answer tht direct. I would rather tell you the facts in the case. Just by saying yes or no, that would not give the answer as it ought to be.

Q. Do you not know that the Central Union Company is excluded from going into certain parts of the city at all, and that a very large part, and sections of the city into which the other company has the right to go? A. The fact of the matter is that we beat them as well where they have not the right to go as where they have got the right to go.

Mr. WORTHINGTON: I move to strike out that answer as not responsive to the question.

By Mr. WORTHINGTON:

Q. Did you understand me to ask you whether or not one company or the other beat the other company anywhere? I would be much obliged to you if you would answer my question and not allow your enthusiasm for your company,

1495 which you represent, to lead you into an argument with me. I ask you whether you do not know as a matter of fact that the Central Union Company is excluded by law from about half of this city, while the Home Telephone and Telegraph Company have a right to go into all parts of it. A. If you will change that to some parts of the city I will say yes. If you say half, I won't say yes, because it is not a fact.

Q. What is the proportion? A. It doesn't amount to hardly a third. I think if you make it some parts of the city you will strike it just about right.

Q. Have you here a map of the city upon which you can delineate the restricted area to which the other company is confined? A. I have a map here, and I can trace it for you pretty quick.

Q. We do not want a big map like that. A. A third would be about right, because they have rights in nearly all the main parts of the city, you know—on all the main streets.

Q. Do you not know that it frequently happens that a man who has a telephone at his place of business and wants one

also at his residence patronizes your company in preference to the other because he can get his residence telephone from your company and cannot get one from the other be-
1496 cause it is outside of his district? A. I don't know one case where a business man that has a business here and his residence is outside where he has not been able to get a Bell telephone.

Q. Do you mean to say all your business men have their residences within the district to which the wires of the other company are allowed to go? A. Yes; they usually have. I do not know of a business man—one case—where they would be excluded.

Q. About how many people live in that one-third, or thereabouts, of the city from which the other company is excluded? A. Well, to give it a large number, say 15,000 people. That is, I am just approximating it. I wouldn't say it was a bit more. It would sooner be less.

Q. Upon what authority do you put the population of Fort Wayne at present at about 50,000? A. On the last year's city directory.

Q. Do you remember what was the population by the census of 1890? A. I think about 37,000, or something like that.

Q. Has a fire occurred at any time in the operating room of the Home Company here? A. Yes, sir; they had a fire about a year and a half ago
1497 Q. What caused that fire? A. I think an electric current. I wasn't with this company at the time in any capacity.

Q. Was it not a matter of common knowledge here that an electric trolley line crossed the wires of this company, and that owing to the want of proper and efficient appliances the electric current went to your switchboard and set fire to it and practically destroyed it? A. The switchboard was not burned. There was nothing burned in the switchboard.

Q. What was burned? A. The cables.

Q. Was not that due largely to the want of proper appliances to protect the cables? A. It was the same as the Bell people had a fire a couple of years ago.

Q. Please tell me about your company. I am not talking about the Bell Company. Just hold down your disposition to argue the facts of the case with me, and tell me about your own company, and let the Bell Company take care of itself. A. I haven't any knowledge of appliances at that time. I didn't know the reasons particularly why the current went as far as it did, or anything of the kind, only I know we had a bad time of it.

Q. You know that you went to work to fix it up so that that

could not happen again, did you not? A. I suppose
1498 they done all they could to prevent it in the future.

Q. Did they get somebody to come down from the office of the Western Telephone Construction Company to help them fix it up? A. They got all the help they could from different places to get rid of the trouble as quick as possible.

Q. Please answer my question. A. Yes; we had a man here from the Western Telephone Construction Company, too.

Q. Did you not have more than one? A. No; I don't know whether we had more than one or not from there or not.

Q. What was his name? A. Johnson, I think. Mr. Johnson was here.

Q. I understand you have not sufficient technical knowledge to explain what caused the trouble or what was done to prevent it again? A. No; I don't have anything in that line to do with at all.

Q. Who is the president of this company? A. Mr. Brash.

Q. What salary does he receive? A. None.

Q. Who is the vice-president? A. Mr. C. F. Hettler.

Q. Does he receive any salary? A. No, sir.

1499 Q. Who is the secretary? A. Mr. Moellering.

Q. What salary does he receive? A. $50 a month.

Q. Who is the treasurer? A. Mr. Fisher.

Q. What salary does he receive? A. None.

Q. Is there any other general officer of the company receiving a salary? A. No, sir. You mean of the board, or anything of that kind?

Q. Any general officer who duties are mainly in the central office here? A. Myself.

Q. What salary do you receive? A. $75 a month.

Q. Do you have an electrical expert connected with your company? A. Yes, sir.

Q. Who is he? A. Mr. Lathouse.

Q. What salary do you give him? A. $90 a month.

Q. How many operators have you? A. I think 22
1500 regular operators—that is, that have a whole day or night.

Q. What do you pay them? A. They average about $20 a month.

Q. How many bookkeepers have you? A. One.

Q. What do you pay him? A. $65. We have a stenographer at $20 a month, a lady who is also office clerk.

Q. How many linemen? A. The linemen are on by the hour—that is, the construction men—when we have work for them.

Q. You have not any linemen whose duty is solely to take care of keeping the plant in repair? A. Yes; we have two trouble men.

Q. What do you pay them? A. $45 each.
Q. A month? A. Yes.
Q. Have you any inspectors? A. Two.
Q. What do you pay them? A. $30 each per month.
Q. Do you have any chief operator or other employe besides the operators in the exchange proper? A. No.
1501 Q. You have a chief operator? A. She is one of the operators that I told you was in with the 23.
Q. Does she get the same compensation? A. She gets $30.
Q. Are there any other employes of the company who are paid by the year except those you have enumerated? A. Collectors.
Q. How many of them? A. Two.
Q. What do you pay them? A. One at $40 and one at $30 a month.
Q. Are there any other employes of the company who are paid either an annual, monthly or a daily wage? A. The switchboard man, you haven't got.
Q. What are his duties? A. He takes care of the switchboard. He keeps the switchboard in repair, and stays in the operating room.
Q. What do you pay him? A. $60 a month.
Q. Do you have any tests made of your wires running through your conduits from the central office? A. Do you mean a test with the subscriber?
Q. Any tests for any purpose. A. We make a test every morning, or the operator does, to find out whether the lines are all right. We make a record of that.
1502 Q. Who does that? A. Each operator on her board. And once a week we make a cable test to see what shape they are in.
Q. What are your conduits, that you use here, made of? A. They are the make of Van Camp.
Q. You stated whose make they are, but you did not state what they are made of. Are they made of iron or clay? A. Clay.
Q. How deep do you lay them beneath the surface? A. I don't know what the depth is now exactly. They are laid deep enough so that when there is any paving or anything to go on they are about six inches below anything that comes in that line.
Q. They are six inches below the foundation of the pavement. Is that it? A. Of any pavement—that is, the upper part of our conduit.
Q. If you should take up, for instance, a brick pavement, then they would be six inches below the surface of the ground that would be left after taking up the bricks? A. Below the concrete at the bottom of that.

Q. If there is a foundation for that brick pavement, the top of your conduits will be six inches away from the foundation?

A. Six inches away from the foundation.

1503 Q. That is the rule, is it? A. Yes.

Q. Can you tell me what it has cost on an average per foot for your conduits or per mile to lay them here? A. No; I can't tell you that. I was not with the company when they put it down.

Q. Is there anything here from which you could extract that information and give it to me? A. I might possibly. The contracts would most likely show that.

Q. What is the area of the city in which you lay underground conduits instead of running pole lines? A. There was no law in regard to it when we put the plant in, and we simply laid one main line down on Calhoun street, all the way out Calhoun street from one railroad to the other, and then went out two squares east and into the alley west.

Q. Does not the franchise of your company or its contract with the municipal authorities here require it to lay underground conduits within a certain territory? A. No; they are trying to pass that, to put it within the fire limits, where it has not been. I might say I never read the franchise through to know what has been required.

Q. Have you got it here? A. Yes; you had it here a little while ago. It is in that book you had.

1504 Q. Please state whether you did not find in that charter the following:

"Said company agrees to erect and maintain no poles nor wires above ground within the following described territory in said city, to wit, except as hereinafter provided: Commencing at a point where the west line of Harrison street intersects the south line of the right of way of the New York, Chicago and St. Louis Railway Company, thence east along said south line of said right of way to a point where said south line of said right of way intersects the east line of Barr street, thence south along the east line of Barr street, if produced south to a point where the same intersects with the north line of the right of way of the Pittsburgh, Fort Wayne and Chicago Railway Company, thence west along said north line of the Pittsburgh, Fort Wayne and Chicago Railway Company's right of way to a point where the same intersects with the west line of Harrison street, thence north along the west line of Harrison street to the place of beginning, said company being required to lay all of its lines within said territory underground in such conduits as hereinafter stipulated for."

A. Yes; that is the limits I told you. I told you we ran a straight line down Calhoun street and then we go west on

Harris street as far as the alley and east two squares;
1505 that is, to Barr street.

Q. How long and how wide is that territory, a description of which I have read? A. It seems to me as though it is about one mile long.

Q. About a mile long and a third of a mile wide, is it not? A. I think so.

Q. Is all your underground conduit within that territory? A. Yes.

Q. What is the average number of ducts in your conduits; or, if you can tell me, how many feet or miles of ducts are in the conduits? A. I couldn't tell you. I think the average is about five.

Q. That would make about ten miles of duct? A. One belongs to the city. Under the franchise we give the city one.

Q. You constructed it? A. Yes, sir.

Q. I am asking now about the cost of construction? A. I told you I couldn't tell you that.

Q. How far apart are your manholes? A. They are at every alley.

Q. How far apart are the alleys? I am a stranger
1506 here. A. They are about 300 or 400 feet. I don't know exactly.

Q. They are about as wide as the blocks then? A. Yes.

Q. Do you have them on every block? A. Yes; we have them in the alleys instead of on the streets, because our leads go up the alleys.

Q. You have them, then, on the streets at the place where the alley intersects the street? A. Yes, sir.

Q. Are your conduits run under the sidewalks or under the streets proper? A. The streets proper.

Q. Then they are in the intersection of the alley and the street? A. Yes; for instance, here we go along Calhoun street—

Q. Please do not indicate on the desk, because that will not go down, and the court will not see it? A. Our main duct goes from the Nickel Plate here down on Calhoun street south, and then by the alleys we run up with ducts to the cable poles into the alleys, and there we have the cable poles.

Q. Are those alley ducts at right angles to the conduits on the street? A. Yes; they run into the manholes.

Q. I wish you would make a little diagram of one of the squares and alleys, illustrating what you have just been
1507 telling us, because I do not quite understand how the conduits are in the street and the manholes are in the alleys? A. The manholes are in the street, but they intersect with the alleys. That is the idea.

Q. I thought you said they were in the alleys? A. I meant they intersect; they go up the alleys. They are at the alleys on the street.

Q. I wish you would describe how your manholes are constructed? A. I can't do that for you.

Q. Why? A. Because I don't know.

Q. Do you mean to say that you are the general manager of this company, but you do not know how its manholes are built? A. I don't have anything to do with the construction work.

Q. You do not even go look at them when they are building? A. Yes; I look at them, of course.

Q. Do you not know how they are built? A. They are built just in the shape of a cistern, and deep enough so that a man can stand in them—possibly lower than that.

Q. What do they build them of? A. Brick.

1508 Q. How thick? A. I think two layers. I don't know. I wasn't there when they built them.

Q. What is the diameter of the opening in the manhole, or of the cistern to which you compare it? A. I think about two feet across, two or two and a half.

Q. Has it a cover? A. Yes, sir.

Q. What is the cover made of? A. Iron.

Q. What does one of your manholes cost here, complete? A. I don't know. I couldn't tell you for sure. My impression is—I wouldn't want to state about that.

Q. Have any of them been built during your time as general manager? A. No; none have been built. They were all constructed at the time.

Q. Is there anything here in the office handy that you could look at and tell us what those manholes cost you approximately or exactly? A. I don't know whether I can lay my hands on them unless they should be in some of the reports. Therefore I wouldn't want to say yes or no.

Q. If that information is here, you do not know where to find it just now? A. No; I don't know where to find it just now.

Q. What kind of cables do you use in your conduits?

1509 A. Those are from the Standard Underground people. All our cables.

Q. I know, but I want to know what kind of a cable it is. The Standard Underground manufactures a good many kinds. Do you know what kind of cables are in your conduits? A. No.

Q. Did you ever see one pulled out or pulled in? A. Yes; lead cables.

Q. All you know is that there is lead on the outside? A. Lead cables, and they are insulated inside.

Q. Do you know how many pair cables they are? A. We have different sizes.

Q. What are they? How many of each? A. We have 25-pair cables, 50-pair and 75-pair, but I simply don't have anything to do with that part of it.

Q. Who does have to do with this underground construction? A. That is what Mr. Lathouse is here for. He is in charge of all those things. That is why we have him oversee all of it. Of course we keep track of things in general.

Q. What kind of a switchboard have you in the central office? A. The Western Telephone Construction Company switchboard.

1510 Q. I know that company makes it, but I want to know what kind of a board it is. Are you familiar with the different kinds of switchboards? A. No; all I know is that it is no multiple board. It is a transfer system.

Q. Do you know anything about the operation of any switchboard except the one here? A. No.

Q. Did you ever have any experience in that line? A. No, sir.

Q. Do you know what the multiple transfer system is on the switchboard? A. Only what I have read about it. I know nothing about that part of it.

Q. Do your reading and observation enable you to tell us whether this board is a board of that kind? A. No; it is not a multiple switchboard.

Q. It was once, was it not? A. No, sir.

Q. Were you here when it was built? A. I was not here. I was not connected with them.

Q. How long after it was built did you first see it? A. I saw it after they had it built or, rather, while they were putting it up, but I paid no attention to it.

1511 Q. How many times since you have been general manager have they had men from the Western Telephone Construction Company down here to work on that board? A. Only that one time, when Johnson was here.

Q. Only the one time, just after the fire? A. Yes.

Q. Are you sure of that? A. To work on that switchboard?

Q. Yes. A. Yes, sir; that is all.

Q. Has its mode of operation been changed at all at any time by your own employees? A. No; nothing at all.

Q. What kind of drops have you? A. I don't know. They are shutter drops.

Q. What causes them to rise and fall? A. The electric current, of course.

Q. That is all you know about it, is it? A. I don't know anything about the electrical part. We have a man here for that.

Q. Who is it who knows all about that? A. Mr. Lathouse.

Q. Do you know whether that switchboard has a distribut-

ing board connected with it? A. Yes, sir; it has. It was put up after the fire. In fact, we had ordered it, but they never got it done for us before that.

Q. Do you mean you ordered it before the fire? A.
1512 Yes, sir.

Q. You did not have any distributing board before the fire? A. No.

Q. What kind of poles do you use here in your overhead plant? A. Cedar poles.

Q. Are they all cedar? A. I don't know what they did use at first, when they commenced.

Q. Have you not seen the overhead plant of which you have been the manager for a year and a half? A. Yes, sir.

Q. Do you know chestnut from cedar when you see it? A. No; I do not.

Q. How many poles have been erected since you have been manager? A. About 200.

Q. Of what wood are they? A. I don't know what kind of poles they did put up.

Q. Do you know what they cost? A. They cost according to the size of them.

Q. Will you tell us what you do as general manager of this company? A. I told you that in the first place.

Q. I would like to have it again, a little more in detail. I understood you to say you had general management of
1513 its business; and I should suppose the purchase and location of poles and paying for them would constitute quite an item. A. That goes to the other department.

Q. I am trying to find out what is left in your department after the other men have their work divided up among them. What is there left for you? A. I do not know whether I can go over the whole thing with you during a day. If you will go along with me I will show you some day.

Q. Mr. Thorwald, you are examined here as a witness, and we desire to know from you— A. And I have told you in regard to those matters. I told you I was not an electrician. I was not put in that position. At the same time, I see that the work is done there. If complaints come in, I see that the proper people look after it and see to it, and in the same capacity in regard to the operating department. If there is complaint of the service, it is my business to bring it down and find out where the trouble is and see that it is taken care of; and the same way in regard to the other parts of it, in seeing into those things.

Q. When your company has to buy some poles, do you have anything to do with deciding how many shall be bought or what shall be paid for them, or what kind of wood they

1514 shall be? A. The by-laws say that the secretary shall get the prices, and of course we consult together in regard to it. The last carload we bought we paid $1.55 on an average for the poles, peeled.

Q. An average of $1.55 for a pole? A. Yes, sir.

Q. Was that pole in the rough, or set? A. No; not after it is set.

Q. But ready, peeled, to be set up? A. Yes, sir; ready to be set up.

Q. Do you know what it costs to set in the ground, ready for the crossarms? A. It depends on where we take them to. It costs about $1.00, or something like that.

Q. Then the cost is somewhere between $2 and $3 apiece, set? A. Yes.

Q. What do the cross-arms and their appurtenances of the pole cost before you put up the pole—everything ready for putting up the wires? If you cannot answer, we will go on. A. I can't tell you that. They cost about so much a mile, but I couldn't tell.

Q. About how much a mile do your poles cost? A. They cost from $80 to $100 a mile.

1515 Q. You have traveled and gone around the city where these poles are, and you have seen them frequently, have you not? A. Yes.

Q. How high are they from the ground to the wire? A. The smallest poles that we use in the city are thirty feet, and we use some as high as 45, and a few of them fifty-five.

Q. Do you use any outside of the city? A. A few lines. For instance, for the Orphans' Home, out there, and the Home for the Feeble-Minded, and places like that, we use 25-foot poles for those places.

Q. When you give the height of the pole, do you give the height from the ground to the wire? A. No; complete.

Q. The complete length of the pole before it is set? A. Yes.

Q. How much of the pole is in the ground when it is set? A. I don't do the constructing. I haven't much to do with it.

Q. You have told us you have seen the poles in the ground. Can you tell us how high it is from the ground to the lower cross-arm as the poles stand? A. I suppose they put them about four feet in the ground.

1516 Q. How many cross-arms are there on your poles? A. That varies. We do not dare to put more than ten on any of them.

Q. How many are there on an average? A. It depends upon the amount of lines we use. The franchise don't allow us to put more than ten on a pole.

Q. You have driven around and seen these poles every day,

have you not? A. There are about four or five, on an average. That is about the average.

Q. What is the distance from the ground to the lower wires? A. I suppose about eighteen feet.

Q. What kind of wire do you use on those poles? A. Copper wire.

Q. It it all copper? A. Yes; hard-drawn copper, we use in the city.

Q. What size or number? A. Number 14 and number 12.

Q. Whose make? A. Sometimes we get it from the Standard underground and sometimes from Roebling Bros.

Q. What does it cost? A. The last we got was 14 and three-quarters cents, and it has gone up now to 16 cents, I think.

Q. You mean 16 cents a pound? A. Yes.

1517 Q. What proportion of your subscribers have the common return circuit? A. About half of them, I think.

Q. And the other half have complete metallic circuit? A. Metallic; yes.

Q. Do you make any difference in your prices for the metallic circuit and the common return circuit? A. No; we don't make any difference. We simply ask this: where lines are most important, we make them metallic for the good of the service.

Q. For the good of the service? A. So as to give better service?

Q. Why is it that the single return wire gives a better service than the common return? A. You are getting into the electrical field again now.

Q. That is out of your bailiwick, is it? A. Yes.

Q. You know the fact to be that the common return subjects the lines to more cross-talk and other troubles than where there is a single return wire? A. Yes; I know that the metallic lines are the best lines, and that when we have trouble in the common return, and we can't get rid of that, we change them into the other.

Q. Why do you not give them all the best service—the single return? A. It isn't necessary.

1518 Q. They do not make any complaint about it, do they? A. No; they are well satisfied.

Q. The people who have the inferior service are just as well satisfied as those who have the good service, are they? A. I don't think that there is that difference in it. You take a person who uses his telephone only a couple times a day for conversational use, just without any particular business—they don't notice a thing like that as much as a business man that uses his telephone all the time, and has to use it, does.

Q. Do you have the common return generally for residences? A. Common return for residences; yes.

Q. About half your telephones are residences? A. Yes; about half.

Q. Then you think that a business man who happens to use his telephone at home does not care whether it is good service or not? A. He pays more for his business telephone. He pays $3 a month for that, and he only pays $1.50 for the other.

Q. He ought to be satisfied with his service because it is cheap? A. I don't say he ought to be.

Q. Is not that the fact, that he ought to be satisfied with his inferior service at his house because it costs less? Is not
1519 that what you said? A. In fact, he is getting the same service for a dollar now that he was getting for three dollars.

Q. You are arguing the matter with me again. I ask you for facts and not for argument. Mr. Birney can take care of the argument. I am no match for you on that subject. You said, Mr. Thorwald, that the service of the common return is inferior to the other, did you not? A. Everybody says that, on account of the electrical appliances.

Q. Everybody knows it is not as good? A. Yes.

Q. It is cheaper? A. Yes.

Q. You use it wherever you can, because it is cheaper, do you not? A. I suppose so. You might say that.

Q. And when a man who has it grumbles a good deal, you give him the other service. Is not that so? A. We consider what he pays for his telephone.

Q. Answer my question, please. Did you not say just now that when you had to get rid of it, you transferred a man from the common return to the other? A. No; I said if we had a case of trouble that we couldn't get rid of any other way, we would make a metallic line out of it.

1520 Q. Then you sometimes do have trouble with the common return that you cannot get rid of without making a different circuit. Is not that so? A. Well; we might get rid of it some other way. I don't know.

Q. You have found that you and your electrician cannot get rid of it without giving the man a complete single wire, have you not? Is that not what you just said? Why do you hesitate to candidly acknowledge what the fact is? A. All right; you can put it down that way.

Q. Is it not a fact that you frequently— A. Not frequently; no.

Q. Because a man had a common return and grumbled and made a fuss about it, you gave him the other? A. I don't say frequently.

Q. It has happened, then? A. It has happened.

Q. Are you confident, Mr. Thorwald, that the telephones of the various classes that you enumerated in reply to Mr. Birney's questions were all the telephones that this company had on December 31st, 1898, in connection with its exchange and in active use? A. Yes.

1521 Q. How much was due to your company from subscribers on account of telephone rentals on that date? A. The reports there show it.

Q. (Exhibiting book to witness.) What was it on December 31st, 1898? A. $1,100.

Q. There was also, was there not, unpaid for the current quarter $6,742.50? A. Yes, sir.

Q. Why was it that when a representative of another company came around here selling what you call the Ericson telephone all your people wanted it? A. It was a better instrument—a dearer one.

Q. How much dearer was it? A. They were desk sets that they sold at $35, and we simply had the wall sets.

Q. That was their highest rate. What were their other rates? A. For wall sets?

Q. I want to know what the Ericson people charged for all their sets? A. We only got the best of it. I think they had wall sets at $17.

Q. Some of your subscribers took the higher price telephone in preference to yours? A. They wanted desk sets. The directors bought ten of them, and we tried to place them. They didn't want them very bad.

1522 Q. Did you not say in answer to Mr. Birney's question that everybody wanted those telephones in? A. Yes, if we gave it to them at the same rates. Of course they wanted it. Why wouldn't they want it? What I said was this: The reason we made a difference in the rate was because those instruments cost so much more than the wall sets, and that if we had put them out at the same price naturally everybody wanted that kind of an instrument, and we were not prepared to buy that kind of instruments.

Q. You said just now they are better instruments. What did you mean by that? A. They are a finer make of instruments. They are not any better. I have had people say: "If you will buy back this Ericson instrument, I would just as leave have one of those others."

Q. When you said they were better instruments, you simply meant they were a little finer in finish? A. Yes; they set on the desk instead of on the wall, and they were handy. They were the combination desk set.

Q. What long distance connection have your telephones?

A. We have connection with the Western Telephone and Telegraph Co.

Q. What territory does not that company cover? A. It covers a part of Ohio, a part of Indiana, and it covers now the southern part of Michigan.

Q. How far from Fort Wayne is the most distant tele-
1523 phone in that system? A. We reach Toledo.

Q. How far is that from Fort Wayne? A. I think we reach about 150 miles.

Q. When you gave us the rates charged by the Central Union Telephone Company here, did you mean to be understood as giving their rates for the best telephones which they supplied to their subscribers? A. I don't mean by that what they call their long distance telephones, although they have got some of them at the same rate.

Q. The prices which you have given us of that company relate to instruments which use what is called the Blake transmitter, do they not? A. Yes, sir.

Q. Do you know the telephone that is commonly known as the solid track? A. Yes, sir.

Q. Do you know what rates the Bell Company has been charging for rental of an instrument of that character? A. I understand they are charging $5 a month for that; while that is their rate, they are furnishing a good many of them for nothing.

Q. How many of the solid track telephones have they in use here now for which they charge no rent? A. I don't know how many.

Q. Tell me where there is one of them? A. None of the newspapers are paying for them.

Q. How many newspapers have they? A. There are four. The Arthur Printing Company didn't pay for theirs for
1524 I don't know how long. They finally took it out. I know Mr. Shambaugh over here, city attorney, doesn't pay for his telephone. I don't know whether under their agreement they have to furnish that kind of an instrument there or not. The fact is, I haven't kept track of their long distance, because there ain't so many of them out. We don't have so much to do with regard to them as with regard to their other telephones.

Q. You have spoken of the Central Union Telephone Company as a local company. Is not that a company which controls several hundred telephone exchanges in the States of Ohio, Indiana and Illinois? A. Yes; I understand they control the exchanges in those States except the large cities, such as Chicago, Cincinnati and Cleveland.

Q. How many of the residents of Fort Wayne are stockhold-

ers or otherwise interested in the Home Telephone and Telegraph Company? A. About ninety.

Q. Do you know any who own stock in the Central Union Company? A. Here?

Q. Yes; any of your citizens or residents here who have any stock in the Central Union Company? A. I know of one family that does. I don't know whether it is direct or indirect, but I know that when I solicited them he told me it wouldn't hardly do for him to put in the Home telephone, and the impression I got from him was that he was interested with the Bell people.

1525 Q. These ninety odd stockholders of the Home Company comprise a very large proportion of your prominent business men, do they not? A. Yes.

Q. How many exchanges has the Home Company here? A. Two.

Q. How many subscriber's wires are connected with these exchanges? A. There are about 1,274 with the main exchange and about 354 with the outside exchange or branch exchange.

Q. How far apart are they? A. They are about a mile apart; a little over a mile.

Q. When was the smaller exchange established? A. About a year and a half ago; a little over that—pretty nearly two years.

Q. It was before you became general manager? A. Yes, sir.

Q. Were you connected with the company at that time? A. No, sir.

Q. Are you sufficiently acquainted with the operations of your exchanges to know whether any record is kept of the number of calls per day? A. Yes, sir.

Q. What record is kept, and how often is it taken? A. Once a month.

Q. Is it reported in writing here to the central office? A. I think we have something to that effect here. Here is a

1526 cut representing one time (witness produces a model).

Q. That represents the different hours of the day; it does not show the number of calls? A. I don't find a report here for this month.

Q. I want it for all the time I can get it? A. We simply kept a record and then turned it over to the directors and paid no further attention to it. I simply wanted to show them how the business had been running.

Q. Was that a memorandum on a loose sheet of paper or was it a formal report signed by you or by the chief operator? A. There were reports made on pieces of paper and a regular report made out of it by the clerk and turned over with the monthly reports to show how many calls were being made.

Q. These reports must be on file in this office somewhere, are they not? A. I doubt whether the directors paid enough attention to that part of it to keep it. I know we changed it every month, so as to get it at certain times.

(The witness at this point retired, and on his return produced a report showing the number of calls of the main and branch exchanges referred to for October 1st, 1898. The witness hands same to counsel for defendant, who examines it.

Witness also produces the September report of the main and branch exchanges, and hands same to counsel for defendant, who proceed to examine it.)

1527 By Mr. WORTHINGTON:

Q. You have not been able in the short search you have made to find reports at this time dating back some time when there were a much smaller number of subscribers? A. No, sir.

Q. You have tendered us certain reports for 1898, omitting the report for August, 1898, which appears to be missing. Is that report kept in any book where we could see it? A. Yes, sir.

(The witness produces book as requested.)

Q. What is the capacity of your switchboard at the smaller exchange? A. 400. There is another place there, though, to put in a section.

Q. Is the building in which the exchange and general offices of the Home Telephone and Telegraph Company are situated owned by the company or rented? A. Rented.

Q. What rent does it pay? A. $45 a month for the main exchange and offices and $5 for the other exchange.

Q. I wish you would describe the building in which the main offices and exchange are situated? Give us the dimensions and number of stories? A. It is a three-story building. The lower part is used for stores and offices, and the next floor is for offices, and the third floor is used for the exchange
1528 and for the Conservatory of Music and two small lodge rooms.

Q. How wide is the building? Of course I mean the part which is occupied by the company. A. 25 feet, about.

Q. How deep is it? A. About 100 feet; that is, the exchange.

Q. Do the figures which you have given represent the rent of the whole building? A. No.

Q. For just that part of it which is occupied by the company? A. The part that is occupied by the company.

Q. Do you know whether upon the books of the company any allowance is made for depreciation in calculating the re-

ceipts and expenses? A. Do you mean depreciation in the value of the property?

Q. Yes; from wear and tear, corrosion and one thing and another. A. No; only what we replace.

Q. I understand you put in what you explained, but I want to know whether any allowance is made beyond that? A. No; we haven't got anything to show that.

Q. I see by the annual report of October last that you spent during the year $867 for maintaining the switchboard. Do you know how that money was spent; what the trouble was? A.

1529 Part of that is for the switchboard man, taking care of it, and then if we have to change cords or any part of the switchboard, such as induction coils or jacks or anything that is out of fix, we charge that to maintaining the switchboard; but that includes the salary of the switchboard man.

Q. You have already told us what that is? A. Yes.

Q. Has there been at any time since you became general manager of the company any appraisement of the value of the company's plant as it stood at the time of the appraisement? A. No.

Redirect examination.

By Mr. BIRNEY:

Q. Mr. Thorwald, can you tell from looking at the two reports, one for October, 1897, and one for October, 1898, the amount of construction work done between those dates? A. The only way I can tell you that would be that in the report of October, 1897, it was charged up at $197,505.84.

By Mr. WILSON:

1530 Q. That is the total amount expended on construction at that time? A. Yes; in plant; and in the next annual report it is reported as $247,748.33.

By Mr. BIRNEY:

Q. Does the difference between those two amounts represent the amount expended in new construction during that time? A. Yes, sir.

Q. The amount, then, of new construction in that time was what? A. $50,243.49.

Q. Your attention has been called to your monthly report, dated December, 1898, and the item "Amount of rental bills unpaid for current quarter, $6,742.50." Will you please state to what quarter of the year that item refers? A. That refers to January, February and March of 1899.

Q. How much has been collected already for that quarter as shown by your report? A. $2,156.

Q. At what time was that report made up? Can you tell? A. That was made up—that is, the financial part of it—up to about the 14th of this month.

Q. January, 1899? A. Yes.

Q. Please look at your monthly reports for the months of October, November and December, 1898, heretofore exhibited, and state if the receipts exceeded the expenditures in each of those months, and to what extent in each month? A. We

1531 took in more than we paid out in October.

Q. How much did your exchange rentals in that month exceed your current expenses for the month? A. We took in $3,609.83 more than we expended.

Q. How was it in November? A. We spent $32.35 more in that month, November, than we took in.

Q. Have you included or excluded the amount that was passed to plant? A. I have taken that out of this.

Q. How was it in December? A. $1,620.48 excess expenses over receipts.

Q. How do you make charges for exchange rentals; for the quarter? A. For the quarter.

Q. In what months are they payable? A. January, April, July and October.

THEODORE THORWALD,
By the Examiner, by consent.

Subscribed and sworn to before me, this —— day of ——, 1899.

——— ———,
Examiner in Chancery.

1532 WILLIAM L. MOELLERING, a witness of lawful age, called by and on behalf of the complainants, having first been duly sworn, is examined.

By Mr. BIRNEY:

Q. Mr. Moellering, please state your place of residence and your connection with the Home Telephone and Telegraph Company, of Fort Wayne, Indiana. A. Fort Wayne, Indiana; secretary of the company.

Q. How long have you been such secretary? A. About six weeks.

Q. Before that time were you connected with the company in any way? A. Not in an official capacity; simply as a stockholder.

Q. What duties have you taken upon yourself as secretary since your installation in that office? A. I have taken charge of collections and overseeing the bookkeeping and purchasing

of the material, and of course, acting as secretary to the board at any of the meetings.

Q. You say that you purchase material. Do you also purchase the instruments used by the company? Their apparatus? A. Yes, sir; in connection with the manager.

Q. It has been testified that some of the customers' lines in use by this company are metallic circuit lines and others are common return lines. A. Yes, sir.

1533 Q. Please state what is the purpose of your company in respect to these latter lines, and what has been done to carry out that purpose?

Mr. WORTHINGTON: I object to this testimony as to what the company is going to do as not having any materiality in this case, however important it may be to the subscribers.

A. The number of common returns is largely due to the rapid growth of the company, and at intervals, as rapidly as possible, cables are being taken out and replaced by others of larger capacity, lessening the common return; and the object of the company is at the present time to as rapidly as possible change the common return to metallic lines, a report of all such necesary improvements having been asked for by the board at its last meeting, and correspondence for the purpose of ordering such material is now being carried on.

Q. Inquiry has been made of your general manager touching bonds and stock of the company sold since October 1st, 1897. Can you give the information as to what stock and bonds have been sold and what prices? A. Stock and bonds together have been sold to the amount of $25,000 since the date mentioned.

Q. To what use was the money put? A. To the increase in the capacity of the plant—enlarging the plant only.

Cross-examination.

By Mr. WORTHINGTON:

Q. Have you had any receipts during that year ex-
1534 cept rentals and royalties and the proceeds of the sale of this stock? A. Yes, sir.

Q. What? A. Toll line receipts.

Q. That has been comparatively a very small item? A. A very small item, hardly worth mentioning.

Q. Have you borrowed any money? A. No, sir; not during this period that you are speaking of, to my knowledge. I may want to change that answer—that is, as to borrowing any money during that period. It may have been just at the beginning of it.

Q. How much did you borrow at or about the beginning of

that period? A. I would have to refer to the reports first to see.

Q. These reports which you have here? A. No; I would have to refer to the books. Since you asked the question, I would state that it is more than likely that there has been money borrowed, because the receipts from rentals were not sufficient to keep pace with the improvements necessarily brought about by reason of the rapid growth of the plant. That was the cause of the issue of new stock.

Q. How much money did you borrow about that time? A. I haven't got that.

Q. Was it borrowed after the 1st of October, 1897? A. My recollection is yes.

1535 Q. Then why does it not appear in this report of the auditing committee made on the 1st day of October, 1898, or in the exhibits annexed thereto, or if it does so appear point out where? A. As near as I can recall the loan was of very short duration, by reason of the issuing and sale of this new stock, and the loan was repaid in a very short time. It may have been just a week or two. I don't say that, however, with any degree of positiveness.

Q. Then it must have been repaid out of the $25,000 derived from the sale of the stock and bonds? A. Yes, sir.

Q. How much was that loan? A. In the neighborhood of $5,000.

Q. From whom was the loan borrowed? A. From Fort Wayne citizens. It was borrowed here from some citizens of Fort Wayne. I do not recall whom.

Q. Will you point out to me upon these reports for 1897 or 1898, or the exhibits annexed thereto, the amount of money that the company had on hand on the 1st of October, 1897, or if you cannot find it in these reports, are you able to give it to me from any source? A. From the monthly reports. The report for October, 1897, shows cash in hand at date of last report $4,583.83.

Q. How much was received for the $25,000 in stock and bonds which the company sold during that year? A. I don't recall that.

Q. Was there any premium, taking it as a whole? A.
1536 My recollection is that there was not.

Q. Please look at the report which has been produced here of your company for the month of October, 1898, and state what balance it shows you had on hand in bank at the date of the last preceding report. A. $3,699.84.

Q. I find then that you had on hand at the beginning of the year $4,583.83. You received during the year according to the report of your auditor, which is in evidence, 4,034.53 more

than you paid out for expenses, dividends and interest. These two sums added together amount to $8,618.13. These papers show, however, that at the end of the year you had on hand $3,699.84, leaving a balance on this account of $4,918.52. If to this you add the $25,000 received from the sale of stock and bonds the total is $29,918.52, yet you have stated, and your reports show upon their face that you have spent during that year $50,000 in consruction. According to this showing, you received from some source which does not appear upon your reports or papers the sum of $20,081.28. How do you account for this apparent discrepancy. A. The question as it appears makes a showing which did not exist, in so far as it makes it appear that money has been obtained from some other source. However, I am not in a position to give light on this subject by reason of not having been in charge of the books at that time.

1537 Re-direct examination.

By Mr. BIRNEY:

Q. The last question asked you assumes that the amount of stock outstanding on the 1st of October, 1897 was $100,000. I ask you to look at the statement for that year and see if the true amount was not $95,000?

Mr. WORTHINGTON: I object to that because I have not assumed anything of the kind, but have simply taken as correct the statement of the witness that the amount realized during the year was $25,000.

A. It is $95,000.

Q. Refreshing your recollection from that report, do you wish to correct your statement that the amount of stock sold was $25,000? A. Yes; that would make it $30,000.

Re-cross examination.

By Mr. WORTHINGTON:

Q. That would reduce the amount of this apparent discrepancy from about $20,000, to about $15,000. Are you in a position to make any explanation as to the remainder? A. No; I am not in position to do so.

WM. L. MOELLERING,
By the Examiner by Consent.

Subscribed and sworn to before me this day of 1899.

Examiner in Chancery.

Further taking of these depositions was thereupon adjourned until Saturday, January 21st, 1899, at Mt. Clemens, Mich.

Fenton House, Mt. Clemens, Mich.
Saturday, January 21st, 1899, 2 o'clock P. M.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney.
Present on behalf of the defendant, Mr. Worthington.

THOMAS F. AHERN, a witness of lawful age, called by and on behalf of the complainants, having been first duly sworn, is examined.

By Mr. BIRNEY:

Q. State your age and place of residence, Mr. Ahern? A. 41; Detroit, Mich.

Q. This testimony is being taken at Mt. Clemens? A. At the Fenton House, Mt. Clemens.

Q. Will you please state why you are here and not in Detroit, and what is your condition physically? A. I was taken down with a very severe attack of rheumatism, and later on with grippe, and was advised by my physician to spend a few weeks here at Mt. Clemens, to take advantage of the baths, which I have done.

Q. What is your present condition? A. I am still very weak, although considerably improved.

Q. What is your occupation now, Mr. Ahern? A. I am an electrical engineer.

1539 Q. Are you connected with any telephone company, if so, which one? A. I am connected with the Detroit Switchboard Telephone and Construction Company.

Q. What has been your experience as an electrical engineer, in what fields, by whom have you been employed and so on? A. I have had a general telephone experience for the past nineteen or twenty years. I started to work with the Chicago Telephone Company in 1879. I left them in 1892 or 1893. Since that time I have been connected more or less with independent telephone companies.

Q. What was your employment with the Chicago Telephone Company; what was its nature? A. I was chief of the maintenance department.

Q. Just state what the maintenance department means? A. The maintenance department of the Chicago Telephone Company when I was chief of it, had charge of running of all new lines, setting all new telephones, maintaining instruments and lines, both in Chicago and throughout the State, wherever the Chicago Telephone Company controlled; inspecting instruments, inspecting switchboards, installing switchboards, doing

construction work to a certain amount of money, and inspecting and accepting all construction work done by contractors for the construction department. In the maintenance department, when I served my connection with the Chicago Telephone Company, I had approximately 250 men in my employ.

1540 Q. Were you in the maintenance department of the Chicago Telephone Company during your whole stay with it? A. The maintenance department of the Chicago Telephone Company was a late organization. The physical properties of the Chicago Telephone Company were reorganized in 1886, I think it was, and at that time the maintenance department was created. Prior to that, the departments were known as the instrument department, the repair department and the line department. For several years prior to 1886 I had charge of what was known as the instrument department and the repair department. The organization of the maintenance department took in these two departments, the repair department and the line department, under one head. I was appointed chief of that department and continued in the position until I left the company.

Q. Can you give us approximately the extent of the system of the Chicago Telephone Company, of which you have spoken? A. When I left the company there were about 10,000 telephones in operation, including private lines and exchange lines. We had exchanges at Elgin, Aurora, Joliet, and toll lines connecting the entire system of the Chicago Telephone Company, which included, I believe, some eight or ten counties in Illinois and a few counties in Indiana.

Q. Since that time in what work have you been engaged? A. I have been engaged principally in the telephone business known as the independent telephone.

Q. Have you constructed any plants? A. I have.

1541 Q. Where? A. I have constructed a plant at Detroit. That plant consists of, I think, about 5,600 telephones. I constructed a plant at Mt. Clemens. When I say I constructed it, I mean I was at the head of the department that constructed it. I did not go out and set poles myself, but they were set under my general instructions given to the foreman. They were constructed according to the plans and specifications that I made up. In Mt. Clemens we had 220 subscribers. I constructed a plant at Ann Arbor—500 telephones. At Munroe over 200 telephones; at Pontiac over 300; at Ypsilanti over 200. When I say over 200, I mean they are along between 200 and 225. At Owassa about 300; and a great many smaller exchanges, averaging from 25 to 100, probably 30 or 40 of them in the State of Michigan. In addition to that, I have built in the State of Michigan 2,500 miles of toll line during the past two

years. I am now constructing or having constructed under my plans and specifications a 1,000 line plant at Jackson, Michigan, and a 4,000 line plant at New Orleans, La.

Q. In the course of your experience in the various works thus indicated have you had occasion to inform yourself of the cost of construction and also as to the cost of maintenance? A. I have always paid strict attention to the cost of construction and also to the cost of maintenance. My experience for years in the maintenance department of the Chicago Telephone Company has been invaluable to me in getting at the cost and estimating the cost of maintenance for independent companies.

1542 Q. From your experience, do you feel prepared to estimate the cost of maintenance of telephone plants of a given size? A. I will give a figure on it as near as I can. I am willing to say what, in my opinion, it would cost to maintain any such plant.

Q. Do you think you can fairly and justly estimate? A. I believe I can.

Q. And that your opinion would be accurate or nearly so? A. I believe so. Of course, I would not want to say off-hand without going into details. There might be local conditions that would increase or decrease, to a small extent, the cost of maintenance; but on a general basis I believe I can come pretty close to figuring what it would cost to maintain a plant that is economically handled. I mean by that where there are not made salaries or made positions, and all this kind of thing that the Bell people have done for years.

Mr. WORTHINGTON: I object to so much of the answer of the witness as undertakes to state what the people called the Bell people do.

By Mr. BIRNEY:

Q. Are you familiar with the city of Washington? A. I have been there. I cannot say that I am any too familiar with it. I looked over the city very thoroughly, that is, as thoroughly as I could in one day. I cannot say very thoroughly, but

1543 I looked over the city with a view to constructing an independent plant in the city of Washington, and naturally looked into the telephone conditions of the city.

Q. Are you prepared to state what in your opinion would be a reasonable and fair cost for a telephone plant of 2,200 capacity for the city of Washington? A. I am.

Q. All that portion of it in the business portion of the town to be constructed with the underground system? A. Yes; I am aware of the underground district.

Q. What in your opinion would be a fair sum to be allowed for the construction of a plant of that capacity? A. $125 a telephone would be a fair valuation, a fair cost of construction.

Q. Do you include in that the contractor's profit? A. The contractor would undoubtedly make a profit. The profit might not be very large, but he would make a profit at $125 a telephone.

Q. Have you also considered what would be a fair or generous allowance for the maintenance of such a plant per annum? A. I wish to say, in regard to that, that since you gentlemen came here I went into the cost of maintaining a plant of 2,000 telephones, and if there is no objection I would like to hand my report in just as I made it out. It will save me talking a good deal. I should have headed it "Cost of Maintaining a Telephone Plant of 2,000 Subscribers."

1544 (The above paper is as follows):

Executive salaries	$3,000
Bookkeeper	1,200
Two clerks	1,200
Four collectors	1,680
Cashier	1,800
Superintendent	1,800
Office manager	1,200
Two chief operators ($420 each)	840
Electrician	1,000
30 operators at $20 each	7,200
4 inside inspectors	2,400
4 outside linemen	2,400
2 foremen	1,560
4 gang men	2,400
5 per cent on $250,000 for depreciation	12,500
Rent	2,000
Taxes	2,500
Stationery	500
Livery	1,000
Materials—batteries	500
Instruments	2,000
Miscellaneous material, etc	5,000
Total	53,600
Add for unexpected expenses	10,000
	63,600

The WITNESS: I would like to say a few words in regard to that.

1545 By Mr. BIRNEY: Certainly; you may say anything in addition that you wish to say.

A. I made this estimate up from the experience I have had in that both with the Chicago Telephone Company, where all expenditures had to be estimated by me, and otherwise. I will say here that I made up an estimate while I was with the Chicago Telephone Company of the expenses of the maintenance department, and handed it in to Mr. Nichols, on the 1st day of the month. The estimate was $39,000 plus. I don't know just exactly the figures. At the end of the month, after Mr. Nichol's clerk had gone over the actual expenditures of the department, he called me into his office—

Mr. WORTHINGTON: I object to this hearsay testimony.

By Mr. BIRNEY:

Q. What did you find? A. And complimented me, saying that I was $1.50 to my good in the estimate for the month. I believe that the estimate I have given for the maintenance of a plant of 2,000 telephones is a very conservative estimate.

Q. By conservative, what do you mean? A. I mean that if anything it is large. I believe a plant of 2,000 telephones handled economically can be maintained for about $30 per telephone.

Q. Under such conditions as exist in Washington? A. Yes.

Q. Are you aware of any climatic conditions that would make it more expensive to maintain telephones in the

1546 District of Columbia than elsewhere? A. No.

Q. Is it more or less expensive to maintain telephones in a cold region, such as Michigan, than in one which is more moderate? A. I would say it would be more expensive to maintain a plant in a cold region because you are more liable to storms. Otherwise, I do not see where there would be much difference.

Q. In making this estimate have you allowed anything for royalties? A. No, sir; I have allowed nothing for royalties.

Q. Why? A. Because it is not necessary to build telephone plants now and pay royalties. In other words, you can build a plant and maintain it without having to pay royalties.

Q. By buying outright? A. By buying outright your equipments.

Q. Can that be done readily? A. It can be done. It was done in Detroit. It is being done in New Orleans. It was done in all the independent plants.

Q. Can you approximate generally the number of houses in the country engaged in manufacturing and selling outright telephone apparatus? A. It would be a mere guess. I would

say there are about 500 or 600 of them. There are a lot of them, anyway.

Cross-examination.

By Mr. WORTHINGTON:

Q. Have you in your mind or can you give us in detail
1547 the details in Washington which you think could be constructed for $275,000 in the same general manner in which you have given the details of your estimate of the cost of carrying on such a plant after it is constructed? A. I could figure on the plant and give the number of duct feet necessary to put in, and the number of poles, but I couldn't do it off-hand very well. I stated I thought it would cost about $125 a telephone. I base that on what I know other plants cost. We built a plant right here in Mt. Clemens, which is, of course, a small plant compared to a 2,000 line plant, and this line here cost us probably $50 a telephone. We built plants outside, elsewhere, that cost us as high as $40 a telephone, sometimes a little higher. The conditions here made it go a little higher. Our large plant in Detroit, of course, cost us a great deal more than it would have cost us if when we started we had had sufficient money to go right ahead with the work. We were delayed and delays cost money. It was also, to a great extent, in the start an experiment. We were unable to give it the necessary engineering attention that it ought to have had in the start, until several months after we started the work. We started in then to do the necessary engineering work.

Q. You have not told us yet how much that Detroit plant cost. A. I will get to that. As near as I can come to it
1548 the Detroit plant cost us about $120 a telephone.

Q. What do you mean by saying as near as you can come to it? Has there been no accurate calculation made on the subject? A. Yes, sir; but I am not bookkeeper or secretary of that concern. They might have spent a few dollars now and then that I wouldn't know anything about. I am not connected with the Detroit Telephone Company except as advisory board; but I think the plant cost—the last figures I had on the plant were a trifle more than $600,000. What the exact figures are I am unable to tell you. You might get them from the secretary of the company. I presume he can show his books and tell exactly what it was.

Q. You have no doubt he would be willing to show us his books and tell us exactly? A. I don't know whether he would or not. I think he would be a big chump if he did.

Q. Why? A. I don't know as it is anybody's affairs to know about the cost of the company.

Q. You think the better way is to have a general estimate, not to show from the books themselves what the cost was? A. No; I say you might see the secretary. As far as I am concerned the secretary can show you the books. If I had the actual figures I would give them to you. I say I think the plant cost about $600,000, approximately. It may possibly have cost a few thousand dollars more.

1549 Q. What did you mean by saying he would be a chump if he did show us the books? A. I simply meant that I didn't think it advisable for an independent company to go to work and show their books openly to their enemy. I don't think it is the business of our company to put their books on the market. Of course we naturally look at the Washington Chesapeake Company just as we do any other Bell Company. There are some things concerning the business that I don't think exactly right to give away. But I will go this far in stating about the construction of the plant: Any time they get up a company in Washington I will contract, and I will secure my contract with the necessary amount of backing, to build their plant for $125 a telephone.

Q. Without knowing what the plans and specifications may be? A. I will draw the plans and specifications myself and submit them to the people to accept, or to have them investigated by any engineer.

Q. You will build it according to your own plans and specifications for that money? A. I would build it according to any plans and specifications.

Q. According to any plans and specifications? A. Any plans and specifications; that is, within the bounds of reason. Of course I wouldn't put up gold wire or silver wire.

1550 Q. Please give me, as well as you can, the details of that plant of 2,000 subscribers which you say could be constructed for $125 per telephone? A. I will do so. If you will give me a piece of paper I will figure it out. It is almost too big a thing, you know, to talk offhand on.

The witness here consumes about fifteen minutes in making a written statement, which he hands to counsel for defendant, and which is as follows:

Switchboard, 3,000 drops, at $20 per drop	$60,000
Instruments, 2,000, at $10	20,000
Labor and materials for setting the instruments	5,000
250,000 construction duct feet of conduit, at 20c	50,000
100,000 feet of cables, at 50c	50,000
Poles, 2,000, at $5	10,000
2,000 miles of wire, at $3	6,000
Cross-arms, braces, &c	1,000
Cable boxes, braces, &c	1,000

Okonite wire for distribution	5,000
2,000 batteries	600
Labor	50,000
Total	$260,600

By Mr. WORTHINGTON:

Q. Now, you can state anything you wish to in reference to any other item. You said you wanted to say something about the switchboard. A. In regard to the item of $60,000 for switchboard I wish to say that I have allowed for switching capacity for 3,000 lines. My idea in allowing for the
1551 extra 1,000 is to have the necessary margin for increased business. In regard to the item of $50,000 for cable, it would appear that I estimated only 100,000 feet of cable. On the contrary, I have made my estimate for 100,000 feet of the largest sized cable. There would be a great amount of smaller sized cable used, at a figure much less than 50c per foot, but for convenience sake in this estimate I have bunched it into the large cable, making the item of $50,000 for the entire cable for a plant of 2,000 subscribers. In regard to the item of $10,000 for poles I will say that some of the poles used in a plant of 2,000 subscribers would cost considerably more than $5, while a great many of the poles used might not cost more than $1 or $1.25, and I believe $5 to be a very fair average. I have bought 500 exceptionally fine 50 and 55 foot cypress poles for the work I am doing in New Orleans at a cost of $5 each. With regard to the item of $5,000 for okonite wire, this is used in connecting aerial cable with the pole route, and also will be used in some of the connections from the underground into different basements. In regard to the item of labor I figured that it would take to build a plant of 2,000 telephones not less than one year. Of course the plant could be pushed and built in six months, provided it was thought necessary to do so; but I have allowed for labor at the rate of nearly one thousand dollars per week for a period of one year. A considerable amount of labor is included in some of the items that I mention here; la-
1552 bor for setting instruments, switchboard complete, includes labor, 50c per foot for cable includes the pulling in of the cable. I wish to say, further, that this estimate is made out in a few minutes, in about fifteen, I think, and it is my impression that a careful survey of the city of Washington would show that a first-class telephone plant could be installed for less than $250,000.

Q. What territory do you include when you speak of the city of Washington; the city proper or the entire District, or some intermediate district? A. I was thinking entirely of the city of Washington.

Q. Do you know where Georgetown is? A. I have never been there, but I think I know where it is. I think it is on the opposite side of the Potomac.

Q. Do you include Georgetown as a part of the city? A. I do not.

Q. Do you know where Takoma is in the District? A. No, sir.

Q. Or Chevy Chase? A. No.

Q. Brightwood? A. No.

Q. Tennallytown? A. No.

Q. Ivy City and Anacostia, do you know where they are? A. No.

1553 Q. Do you include any of those places? A. No. May I ask a question now, or am I entitled to ask a question?

Q. You are not entitled to it, but you may ask it, and we will see whether we will answer it. A. Are those towns you mentioned connected by direct wires to your main exchange in Washington?

Q. They are. A. Individual wires, branch exchanges?

Q. No; there are no branch exchanges; they are all connected with the main exchange; and I might say that you are mistaken about Georgetown. It is on the other side of the Rock Creek, on the same side of the Potomac. A. All I know about Georgetown is what I read about it in history.

Q. And I will say for your information, what we all know in Washington, that all these places are within the telephone district of the Chesapeake and Potomac Telephone Company, connected with the Washington exchange. Would it make any difference in your opinion as to the cost of a telephone plant whether it was concentrated in the city of Washington proper or was spread out over a territory many times in extent the area of the city? A. It would make some difference in the cost of the poles and wire, although I have been very liberal in the amount of wire. Not knowing the exact distances of the territory covered by the plant in Washington, I would be unable to say how much, but I do not think it would be very

1554 much. As a rule, the construction of pole routes of this kind are cheaply constructed affairs. I noticed something of the pole lines while I was in Washington looking around, and they would not be considered first-class construction.

Q. Do you mean telephone poles? A. Telephone poles.

Q. Where are they? A. I can't mention the names of the streets. I drove around there and looked at the poles. We have all got means of telling telephone construction from telegraph construction. The large pole routes that I noticed were very finely constructed, but when I have reference to the poor construction it was the pole routes farther out.

Q. About how many feet of conduit are included in your estimate of 250,000 duct feet? A. Of course that would be pretty hard to figure out. I figured the number of duct feet that was required in Detroit for a plant more than double the size of the plant here mentioned. We used in Detroit about 550,000 duct feet for a capacity of 6,000 lines. It would be necessary to figure out the exact running feet of conduit to know the limit of the underground district. It would be impossible for me to say exactly the number of running feet, but I believe 250,000 feet would cover the number of feet the people have put down in Washington. You can show that up yourself and see how near I am right.

Q. Have you made any allowance for conduits or ducts required in case of an increase in the number of subscribers? A. That would include the increase.

1555 Q. What proportion of increase over 2,000 subscribers? A. It would be an increase of 25 per cent.

Q. That would be up to 2,500 subscribers? A. Yes.

Q. Then under this scheme, if the number of subscribers should be increased to 3,000, it would be necessary to reopen the streets and lay down new conduits? A. That would be a question to be decided on if you are going to construct. I am giving you what it would cost to build a 2,000-line plant. If you are going to build a 2,000-line plant, and the people thought it advisable to go beyond 2,500, or 25 per cent, we would simply make the estimate up to 3,000, or whatever would be thought desirable. Then more than that, in laying out a conduit system you may lay it out with exactly a capacity for 2,000 and allow no margin at all, and with the conditions as they exist in Washington similar to the way they exist in Detroit by running a small lateral conduit or cross-line conduit of as great a capacity as was necessary, you could vastly increase the carrying capacity of your conduit, because you would connect your different mains together and utilize the margins of all.

1556 Q. Have you made yourself acquainted with the regulations adopted by the municipal authorities in Washington, regulating the matter of conduits for telephone, telegraph and electric light cables, manholes, telegraph poles, and other matters involved in the construction of a telephone plant? A. I had a talk while I was in Washington with Senator MacMillan's private secretary.

Q. Mr. Moore? A. Mr. Moore. We had quite a lengthy conversation in regard to telephonic conditions in general. I might say we went over the ground very carefully.

Q. You observe I am only asking you a specific question. A. All the information I have in regard to the regulations is what transpired in conversation between us. That is all. I don't remember half what he said now, to tell you the truth about it.

Q. Had you in your mind just now, when you were making this estimate, what those regulations are? A. I have not. I could not say absolutely what they are.

Q. How far below the surface are your conduits laid? A. We average about 30 inches from the top of the conduit.

Q. To the bottom of the foundation of the pavement? A. To the top of the pavement.

1557 Q. Does the cost of laying telephone conduits depend at all upon the character of the pavement? A. Yes; it does to some extent.

Q. To what extent? A. To a very small extent.

Q. What percentage would you give us as one versed in such matters, as the increase in cost in laying such conduits where there is a sheet asphalt pavement over the cost where there is a Belgian block or brick pavement, or would the increase be the other way? A. I think the increase would be favorable to the asphalt. It costs more to lay the asphalt than it does either the Belgian block or the brick.

Q. You say you think it would, Mr. Ahern. Do you know from your experience? A. I know it would; yes.

1558 Q. Do you know how much more it would be on an average? A. My experience in repaving has been in this manner: In repaving brick or in repaving Belgian block. I think we took up some Belgian block. If we did not, we took up some granite, which is practically the same.

Q. Is this in Detroit you are speaking off? A. Yes, sir; in Detroit. We utilized the old block or the old brick, but in putting down the asphalt new asphalt had to be laid. In all my experience in paving the contractor was under bond, and he had to do this repaving himself; so he charged us a great deal more than what he paved the entire street for per yard. It cost us more to do our repaving per yard than he got for the first contract. I should think it would cost ten per cent more at least. Maybe it was more than that; probably 15 per cent more to relay asphalt than to relay the Belgian block and 10 per cent more than brick. The reason of the brick being 10 per cent is that there are quite a number of the bricks broken in taking them up, and they have to be replaced by new ones; but it is customary wherever it is possible to avoid taking up asphalt pavement to lay conduits. I am not aware of a single place in the United States where an asphalt street is torn up to lay conduits. When I speak about that, I mean lengthwise of the street. I do not mean crosswise. Of course you may have to do that, or you may have to go a block to get out to another street.

Q. I would like to have your opinion as to what it would cost per foot at the present time to lay in the city of Washington a four duct conduit, the top of the conduit to be 30 inches below

the surface of the pavement, the pavement being a sheet
1559 asphalt one. Assuming that there was a considerable quantity of the work to be done, say several miles? A. I will have to ask you for paper again to figure it out. Why four duct?

Q. Because I choose. A. I have made up a statement here showing what, in my opinion, a running foot of four-duct conduit would cost, laid in an asphalt street:

Conduit, 4 duct, at 6½c per foot	.26
Exacavations one-third of a cubic yard	.10
Refilling one-sixth of a cubic yard	.05
Laying	.03
Concrete	.03
Repaving and cleaning away	.22
Making a total of per running foot of a four-duct conduit.	.69

I wish to say in regard to the last item of repaving that I am not certain but that I am a trifle low in my estimate, and would be willing to change the estimate so as to show the item of repaving to read 25c. I believe I would be better satisfied myself to say 25c there. That would make the total cost per running foot of four-duct conduit 72c.

Q. And it would make the cost per duct how much? A. That would make the cost per duct 18c.

Q. Why, then, is it that in your estimate of the cost of the entire plant you have put the cost per duct foot at 20c.? A. Because the question you asked me to figure on as to the
1560 cost is one of the hardest conditions. It is nearly the extreme one way, and it does not show the average cost of the laying of conduits. I mean you have given me one of the hardest conditions. You have only given me a four-duct conduit, where if you had given me a conduit of twenty ducts or thirty ducts I could show you that it is much cheaper per duct foot. My price is an average cost per duct foot.

Q. I am calling your attention to the fact that the average cost in your estimate here is more than you fix as what you say is the extreme cost. That amounts to 18c per duct foot, while you figured on the whole at 20c per duct foot? A. Very true, but in this 18 cents per duct foot I do not include manholes or castings, while I do in my 20-cent per duct foot.

Q. In your estimate of 20 cents a duct foot, have you allowed for any part of the work being done where a sheet asphalt pavement had to be torn up and replaced? A. I took into consideration different kinds of pavement. I do not think you could build a conduit for 20 cents a foot where you had to tear up the asphalt all through.

Q. How much would it cost under such circumstances? A. I think it would cost you 22 to 23 cents a foot, probably.

Q. About what would be the average cost of the manholes in your proposed plant in Washington? A. The average manhole ought to cost about $40.

1561 Q. Describe the construction of such a manhole as you have in your mind. A. I didn't have any special manhole in my mind. I took what a large manhole would cost and figured on what a smaller manhole would cost. The large manholes cost as high, probably, as $100, but you wouldn't use many of them. Small manholes, where a cable distributes in different blocks and places, would cost a great deal less than that, and I average it up and figure it would cost about $40 for the average manhole. I will describe the large one, if you wish, or the average one, if you want me to.

Q. Describe the large one that you think might cost $100. A. I would say that the walls of the manhole would be 13-inch walls, and I would say that the inside measurements would be 6x6 feet. I would say that it would have four or five inches of concrete in the bottom of the manhole. You would have a sewer connection from your manhole from the center. Your concrete floor would be built in such a way that it would drain to the center. You would have a square cover on such a manhole resting on two I-beams. From the I-beams over to the walls would be angle iron placed in such position that a brick would fit in comfortably between them. On top of this brick would be the regulation concrete, and on top of that would be the pavement, which would bring the top of the manhole flush with the street.

Q. What kind of pavement? A. Whatever kind was down there. It would have to be arranged for whatever
1562 kind of pavement it was. If it is asphalt pavement, you simply have to have more concrete to get to the top than you would if it was brick.

Q. About how many manholes would you expect to have to accommodate the drawing in and drawing out of your cables in 250,000 duct feet of conduit? A. I should imagine you would require from 75 to 90. It would depend, of course, on local conditions where you were doing the work. From what I saw in Washington, I should imagine about 80 manholes would be sufficient for the underground conduits.

Q. What do you mean by a cable box in telephone construction? A. A cable box is a box generally placed on a pole. It might be placed on a wall, but it is generally placed on a pole and holds the terminal for a cable. The cable is fed from the subway or terminal room of the building through an underground duct until it passes the underground district, and from that point it is taken generally through an iron pipe into a

cable box. In this cable box it is connected and ends in a terminal, and from this terminal it is connected with the line wires on the pole by means of this okonite wire that I mentioned, or jumper wire, as we call it.

Q. What would be the average height of the telephone poles included in your estimate? A. I can say right here that I am opposed to putting the poles higher than 55 feet. It has has been customary in the past to put up high poles, as high as 65 and 75 feet, but more modern construction would be
1563 not to put up poles higher than 50 or 55 feet, and wherever aerial obstructions were found to get around them by means of cable. The average height of the poles I have reference to there would probably be 40 feet.

Q. From the ground to the wire or from the whole length of the pole? A. The length of the pole.

Q. How much of the pole would be in the ground and how much would be occupied by the cross-arms? A. A 50-foot pole would be set 6 feet in the ground.

Q. You take 40 as the average, do you not? A. Yes; the average.

Q. Suppose you took the average pole? A. I want to say this: I do not believe the answer I could give you in regard to the 40-foot pole would be covering your question.

Q. Very well; answer it in your own way. A. Because it is just the same as manholes. You asked me to describe the average manhole. It is a pretty hard matter, because I was simply giving the average cost of the different kinds. But I will say this: A 50-foot pole is set 6 feet in the ground; a 45-foot pole is set pretty close to that—they set them about 5½; a 40-foot pole they usually set 5 feet in the ground; and with 35 and 30-foot poles they are satisfied if they go down 4½ feet. The top cross-arm is usually put on about 6 inches from the top of the pole. That is my idea of construction. It is nearly all done the same. The next cross-arm is put on accord-
1564 ing to the ideas of the engineer. I have seen them put on 12 inches apart and I have seen them 18 inches apart. I usually put them myself about 15 inches apart. I think for city work 15 inches is sufficient. For toll work, where you have a long distance to go, I like to have the wires as far apart as possible. A ten pin cross-arm would measure about nine feet.

Q. I was not asking for the particulars of the cross-arms. A. All these details very seldom figure up alike. You might want to do an engineering job on a telephone plant, and you would figure such and such a thing was all right. I might come after you and I would say: "He is all wrong," and do it different from that.

Q. The regulations of the municipal authorities in different cities do not agree on these points either, do they? A. I don't think the regulations in regard to the setting of the poles is any different from what I have given you. I have never seen any regulations that would oppose the setting of a 50-foot pole 6 feet in the ground. That is considered a very fair depth for a 50-foot pole.

Q. What, in your judgment, would be the average cost of the telephone poles in this proposed construction, and by that I mean the pole set in the ground with its cross-arms, pins, insulators and everything complete ready for the wire? A. You mean the average now?

Q. Yes. A. You understand, before I answer the question, that a great many poles in an exchange of 2,000
1565 would be 50 feet tall, and would have as many as ten arms. There might be other poles that would not be over 30 feet tall, and not have more than one arm.

Q. I am aware of that; but you have put a lump number of poles at a lump price, and I understand that in doing that you were taking the about average, and I am pursuing the same course. A. I would say that the average cost of a pole in a telephone plant of 2000 subscribers, including the cost of the pole, the setting of same, shaving and gaining, cross-arming, bracing, placing the pole ready to receive wires, would be about $14, and I have got different items enumerated which I can give you if you wish.

Q. Please give them.

A. Cost of pole	$5.
Hauling pole	2.
Setting pole	1.
Gaining pole	.50
Shaving pole	1.
Cross-arms—six	1.25
Braces	.50
Lag bolts	.50
Steps	1.
Painting	1.25
Total	14.

Q. Does that include the insulators? A. No; it does not include the insulators. The insulators are never put on until the wire is run.

1566 Q. When was it that you made the estimate in Chicago of $39,000, which turned out to be almost absolutely exact? A. I think it was in 1891. I can refer you to Mr. W. W. Nichols who was then superintendent of the Chicago Telephone Company. Mr. Stone, who is dead now, was the President of the company.

Q. Was that an unusual estimate that you made at that time, or was it in the regular course of business? A. It was closer than I ever came, although I came reasonably close.

Q. I am asking whether this estimate was in the regular course of business? A. It was in the regular course of business.

Q. What was the regular course of business about that? A. One of the rules of the Chicago Telephone Company was that all work done there had to be estimated. In fact, we had to estimate the cost of our maintenance; we had to estimate the cost of our construction; and all that work came under the heads of the different departments. The manager of the operating department had to estimate the cost of operating his plant for the ensuing month, and so on. I presume that was with a view of knowing a month ahead about what their expenses would be, or coming pretty close to it.

Q. Of seeing what their expenses would be of running their plant? A. I think so.

Q. Was the estimate made each month for the coming month? A. For the coming month, yes. It was made in advance.

1567 Q. What experience, if any, have you had in constructing or operating telephone plants in warm or moderately warm climates; in other words, what is the plant which you have built or operated further south? A. My experience so far, with the one exception that I am building a plant now in New Orleans, has been about on a line of where we are now. I have not been very far south. I have been in central Illinois. That is a little farther south than here, but I will say that with the exception of storms and more severe frosts up here, that there would not be much difference. The difference, of course, in maintaining a plant, would be favorable to the southern or warmer country.

Q. What is the next largest plant to the one at Detroit that you have constructed? A. We haven't got Jackson quite finished yet. That would be the next. Of course, in regard to that, I will say right here that while I did not have the actual charge, or was not the head of the Chicago Telephone Company, I was interested in all the work just as much as any man could possibly be.

Q. Were you with them when they began constructing that plant? A. I started with them in 1879. The plant was started before that time. They had their plant, I presume, started a year and a half or something like that before that time. That is, they started a little bit of a plant. There isn't

1568 any of the old plant left now. They were down in the basement of 125 La Salle, in a room smaller than this.

Q. I was speaking of a plant of which you have been in charge of the construction? A. Jackson, which is not quite finished, would be the largest plant outside of Detroit. The New Orleans plant, when it is finished, will be the next largest.

Q. What is the plant next to Detroit which you have actually finished constructing—the next largest? A. I would say it was Ann Arbor.

Q. That is an exchange of about 500 lines? A. About 500 lines; yes.

Q. What is the next largest? A. I think Pontiac.

Q. Then go on with the next largest, for two or three. I want to get several of them. A. Next to Pontiac would be Sault Ste Marie; Owassa; Mt. Clemens; Monroe. I think I would be justified in saying that our Jackson plant of 1,000 subscribers is just about completed.

Q. What are some of the smaller plants you have constructed? A. I have constructed a plant at Grand Ledge, 60 telephones; at Flushing, 40 telephones; at Eaton Rapids, 75 telephones.

Q. About what was the cost per telephone of installing the plant at Flushing? A. I think it cost about $50 a tel-
1569 ephone. I would like to explain a little bit about that, if you please.

Q. You have a right to make any explanation that you think is necessary to a clear understanding of your testimony. A. In building most of the plants of the smaller size, I equipped the plant with a switchboard with 100 capacity to take care of future growth, so of course it naturally cost a little more per telephone than if we build right up to 100; and in the size of our poles and cross-arms we allowed margins, naturally expecting more business.

Q. In other words, you made a more liberal percentage of allowance in the smaller towns than you did in the larger ones? A. I think I did; yes.

Q. With that understanding, what was the cost per telephone of the plant at Eaton Rapids, with 75 telephones? A. I did know exactly what Eaton Rapids cost, to a cent; I think it cost about $45—along in there.

Q. At Grand Ledge? A. At Grand Ledge was a little different kind of construction. It did not cost so much as that. It was a part of the system which we had bought. The Western Company owned that system through there, and we simply reconstructed what they had, and just got it working in good, fair shape. I do not presume it cost us, probably, more than $25 per telephone. Of course the construction is not up to the standard of the other, where we put in all the poles, etc.

Q. Now, Monroe? A. I would say Monroe cost us about
1570 $50 a telephone.

Q. Mt. Clemens? A. Mt. Clemens was the first exchange we built outside of Detroit, and we had to do a considerable amount of experimenting there. We found different things didn't work just as we expected, and Mt. Clemens cost us probably $55.

Q. Owassa? A. Owassa was a contract job. I built the exchange there for local people. I don't remember just what the contract was. That was made by our Secretary, Mr. McLeod.

Q. Could you approximate it? A. No; I cannot approximate it.

Q. Sault Ste Marie? A. Sault Ste Marie cost us about $50 a telephone.

Q. Pontiac? A. At Pontiac it was different, too. The majority of the telephones are on either side of the principal business street, and it cost us much less to construct the plant at Pontiac than it has to construct any plant in the State of its size. Pontiac did not cost us over $35, or you may say $40, to be sure about it.

Q. From $35 to $40? A. Yes.

Q. Ann Arbor? A. The Ann Arbor exchange cost us about $55.

Q. Jackson? A. The Jackson exchange will cost us complete, I think, about $65. In regard to the figures I have given of the cost of the different exchanges mentioned above, they are approximately given. I am not certain as to the
1571 exact figures, but give them as what I think they are, and the figures I give include only actual construction.

Q. Do they include just what you have included in your estimate of the cost of a Washington plant? If there is any difference, I would like to know it. A. They include just the same as I have given you in the estimate of the Washington plant; yes, sir.

Q. Do any of these plants, which we have been enumerating, I mean any of those outside the cities of Detroit and Chicago, include underground plants, or are they all overhead systems? A. We have some underground conduit at Ann Arbor and at Jackson.

Q. What proportion of the whole in each city? A. In Jackson they have an underground system. I did know the exact number of duct feet I put in, but I can't recall it. I think we put in Jackson something like 35,000 duct feet of conduit. In Ann Arbor there is no underground limit, and we put in conduit more to accommodate people who did not like high poles put up in front of their places of business. I

believe our Ann Arbor underground construction did not cost us more than about $2,500. It is a small amount.

Q. What long distance connections have the plants which you have been enumerating? A. All the plants I have been enumerating have long distance connections with Detroit.

Q. And with what other territory? Give approximately the length and breadth of the territory included in
1572 that system. A. Detroit talks with Saginaw and Bay City; Detroit talks with Grand Rapids and Detroit talks with Adrian and connections through Adrian up through Indiana. We get connections through Adrian into Cincinnati. We have direct connections, of course, with Jackson.

Q. What is the distance from Detroit to the extreme point of this system? A. What is the distance between Detroit and Muskegon? I think that is our longest connection; I don't know. I would say approximately 250 miles.

Q. What do I understand to be your present connection with the Detroit Company? A. I am the advisory or consulting engineer.

Q. Do you receive any salary or compensation? A. I do not —not from the Detroit Telephone Company.

Q. Have you at any time? A. I have, yes.

Q. How long have you been serving it without compensation? A. The service I render to the Detroit Company is service given at meetings of the Board of Directors or of the Executive Committee. I should say that I am a member of the Executive Committee of the Detroit Telephone Company, as well as a member of the Board of Directors, so that all the labor I give is merely advisory.

Q. Have you been employed by it any time at a stated compensation, monthly or annual? A. I have.

1573 Q. My question is how long it is since your compensation ceased and you rendered such services as you do render without pay. A. I have not received pay from the Detroit Telephone Company for the past three months, or, in other words, since I have been South a great deal.

Q. Is that because they have not paid you or because you had an understanding you were not to receive pay? A. I had an understanding.

Q. What was your compensation before that? A. I do not care to answer that.

Q. Why? A. Because I do not think it is material to the case.

Q. You have been telling us what would be a fair rate of compensation for all the employes of the Company in Washington, and I think it quite reasonable that we should ask what actual compensation is received by the employes of the

company with which you have been comparing it. I think an actual fact as to compensation is worth a good deal more than anybody's opinion. A. Well, I will say that the Detroit Telephone Company paid me a salary of $150 a month.

Q. Why do you say you will say that? What do you mean by that? Is that the actual fact? A. They have paid me $150 a month.

Q. Had you any contract with them for any different rate of compensation? A. No; not for salary.

Q. Were you to receive any compensation beyond a salary? A. I was to receive a compensation beyond a salary for
1574 patents.

Q. Was that compensation in money or in stock or bonds? A. It was principally in stock and bonds.

Q. What is your connection now with the Detroit Switchboard Telephone Construction Company? A. I am the General Superintendent of it.

Q. How long have you held that position? A. Ever since the company formed, a year ago last March.

Q. What are your duties in a general way? A. I am at the head of the practical department.

Q. Did you have anything to do for either of these companeis in constructing the opposition plant, as it is called, in the city of Detroit? A. No; the Detroit Telephone Company built the plant in Detroit.

Q. And these other plants you have constructed were for— A. For the New State Telephone Company.

Q. What is the business of the Switchboard and Construction Company? A. To build telephone apparatus, construct plants—anything in the line of electrical contracting.

Q. What compensation do you receive from that company? A. I receive $300 a month salary.

Q. That seems to be a larger salary than you allow anybody in Washington. Why is that? A. I probably do different work from anybody in Washington. Therefore I am entitled to it. My work in the Detroit Switchboard Tel-
1575 ephone & Construction Company includes designing equipment. It also includes the engineering of the plants, the installing of large switchboards, and the building of same, all of which is under my supervision.

Q. How many patents have you taken out on telephonic apparatus of one kind and another? A. I believe there are four allowed.

Q. Are they all alive now? A. Yes.

Q. What is the date of the earliest of them? A. Close on to a year ago. There are several pending.

Q. What part of the apparatus do these patents granted

and applied for cover? A. I can't see that your course of questioning has anything to bear on this Washington plant, and I just simply refuse to answer.

Q. I am not going to ask you to give the details of these patents, but I am simply getting in a general way at the parts of the plant to which they refer. A. The patents that I have been working on principally are telephone equipment, switchboard and instruments.

Q. You have no objection to stating those which are already issued? A. There is a switchboard patent. Another is a transmitter patent. Another is a jack patent, I believe, and another is a transmitter arm patent. The next one is another switchboard, and there are several mechanical patents in for equipment.

1576 Q. You have no objection to stating that your opinion the present telephonic apparatus, whether it relates to switchboards or telephones, or the intermediate apparatus, is capable of being improved upon, and is likely to be, by you and other inventors? A. I have invented a new switching apparatus, which, in my opinion, is the best switchboard to-day in the world, barring none.

Q. Is that covered by one of your patents which is issued, or which you simply have applied for? A. Which I have applied for.

Q. In your estimate of the cost of operating a plant in Washington, the first item is "Executive Salary, $3,000." What does that mean? Does that refer to one person or more than one? A. It refers to the man in charge of that company. It would be most likely a Secretary and Treasurer, or probably you might call him a President, or whatever you want. I figured that the head of a plant of 2,200 telephones at $3,000 would be a very fair salary.

Q. Do you think one bookkeeper would be sufficient for a business of that size? A. I do, entirely sufficient for that sized plant. Of course one bookkeeper would not be sufficient if there were a lot of toll lines coming in there which would be a different thing entirely from the operating of a local exchange.

1577 Redirect examination.

By Mr. BIRNEY:

Q. Mr. Abern, what are the rates for telephone service in Detroit? A. We are charging in Detroit $40 for a three or five-year contract to a business house; $25 for a three or five-year contract for a residence; for a single year contract, $46 for business and $30 for residence.

Q. Do you know what telephone companies are established

in Toledo? A. I know the Central Union is there. I am well acquainted with the Central Union.

Q. Is there any other? A. There is an independent company there, but I don't know much about it; I am not acquainted with it.

Q. Are you acquainted with the rates charged by the independent company? A. No; I don't know anything about them at all.

Q. What are the rates charged in Detroit by the licensee of the Bell Co., the Michigan Telephone Company? A. According to their advertisements, they are charging $36 for business telephones and $24 for residence telephones. They have adopted what they call a one-way transmitter system, which is much lower than that, although I don't know the exact price. It was in the paper the other day. That is where I get that information from. They also adopted a party line system, in which the price was considerably lower, though I can't say just what it was.

Q. You have given an estimate for maintenance for a 2,000-instrument plant. I would like to ask you whether you
1578 would increase or decrease the amount per telephone and of annual cost per telephone, with an increase, say, to 4,000 telephones. If so, how much? A. An operator in a 2,000-line plant will answer more subscribers than she could answer in a 4,000-line plant. Therefore the cost of central office service would be more in a 4,000 line plant than in a 2,000-line plant. The cost of sustaining the instruments would also be more in a 4,000-line plant than in a 2,000-line plant. The cost of operating the lines would be about the same per telephone, while the cost of operating the conduit would be less per telephone for a 4,000-line plant than for a 2,000-line plant.

Q. Taking all these elements together, what would be the total result? A. The total result would be that it would cost somewhat more to operate a 4,000-line plant per telephone than it would a 2,000-line plant.

Q. Could you approximate how much? A. About 12½ per cent.

Recross-examination.

By Mr. WORTHINGTON:

Q. Does not the Michigan Telephone Company in Detroit have a higher rate than any you have mentioned where the subscriber is furnished with a solid back telephone and corresponding long distance equipment? A. They may have. Not that I am aware of. I am not familiar with that. I should imagine they had.

1579 Q. Why should you think so? A. The reason I think so is because it is customary to have a higher rate in

every place I have been. I want to say that the Detroit rates that I have given there include what is commonly known as the long distance transmitter.

Q. You mean for the Detroit Telephone Company? A. For the Detroit Telephone Company.

THOMAS F. AHERN,
By the Examiner, by consent.

Subscribed and sworn to before me, this —— day of ——, 1899.

————— —————,
Examiner in Chancery.

The further taking of these depositions was thereupon adjourned, subject to notice.

1580 Washington, D. C., February 3rd, 1899, 11 o'clock a. m.

Met pursuant to agreement at the office of John J. Hemphill, Washington Loan and Trust Building, Washington, D. C.

Present:

On behalf of the complainants, Mr. Birney and Mr. Hemphill.

On behalf of the defendant, Mr. Wilson and Mr. Worthington.

THOMAS B. FERGUSON, a witness of lawful age, called by and on behalf of the complainants, having been first duly sworn, is examined.

By Mr. HEMPHILL:

Q. Major, will you give your residence and age? A. My residence is in Baltimore. I am temporarily residing in Washington, but my legal residence is in Baltimore. I was born in 1841.

Q. State whether you have ever resided in Sweden and in what capacity you were there? A. I was there as Minister of the United States to Sweden and Norway, and resided in Stockholm.

Q. How long were you there; in what years? A. From April, 1894, until the end of February, I think, 1897.

Q. What is the size of Stockholm in population? About what is the population? A. It is between 250,000, I should think, and 280,000. I cannot be accurate, but it is about

1581 that population.

Q. Do you know whether they have telephone service there? A. They have a telephone in very general use.

Q. Do you know whether they have more than one company? A. They have one company which is known as the Allmanna,

which means commercial company, a stock company—that is the Swedish title of the company, and the other is a telephone operated by the Swedish Government. It is called the Riks telephone or Government telephone.

Q. Can you state within what area the Allmanna Company operates? A. I cannot accurately, but within perhaps twenty to thirty or forty miles of the city—a circle round the city of Stockholm.

Q. Can you state whether it operates throughout the city? A. Throughout the city.

Q. The Riks telephone operates where, generally? A. Throughout the city and also throughout the Kingdom of Sweden. I am under the impression, also, that it connects with lines in Norway of the Norwegian Government and private companies.

Q. Have you any personal experience in the use of the telephone there? A. Yes; in the legation office there were both telephones—the service of both companies, during the whole of my term.

Q. What was the character of the service; good, bad
1582 or indifferent? A. Very excellent.

Q. What was the character of the instruments? A. Perfect; they were very satisfactory.

Q. Do you know what instruments they used? A. I cannot say that the Ericson was the only instrument, but I know that it was in very general use. Ericson has a factory in Stockholm.

Q. How did the service compare with that in the United States, for instance, in this city and in Baltimore? A. I think it was as satisfactory, certainly. I do not know but what it was a little more prompt.

Q. What were the rates for a telephone per annum in Stockholm?

Mr. WORTHINGTON: The objection which has heretofore been made to the testimony relating to the rates and service in other cities than Washington is renewed, and it is insisted that even if it is competent to go into such matters relating to other cities in the United States, it is not competent to go as far as Sweden and Norway in determining what are proper rates in Washington.

A. The Allmanna telephone charged during my term of service there 80 krona per annum for a separate wire and unlimited service, and the Riks telephone I did not use until the close of my service, and at that time the charge was 50 krona per annum.

Q. How much would 80 krona and 50 krona be in American money? A. The treasury equivalent is 26.8 cents, so in round numbers it is about one-quarter.

1583 Q. The krona is about a quarter of a dollar? A. It is about 26.8 cents. We usually calculate it at 27 cents.

Q. Do you know how long the Government has been conducting this telephone business, the Riks telephone? A. No; not of my own knowledge. It was in existence when I went to Sweden in the spring of 1894, and, although I had not a government instrument at that time in the office of the legation, there was a ready exchange between the two companies or two lines.

Q. How do you mean, a ready exchange? A. They will switch you from one line to the other.

Q. What is the cost of that? A. Ten ora, or about 2.7 cents in American money. It is really 2.68 cents.

Q. Did you have occasion to use the telephone in long distance talk? A. Very frequently, communicating with the Gottenberg, with the consulate there.

Q. How far is that? A. It is a little over 500 kilometers.

Q. How many miles? A. A kilometer is five-eighths of a mile. It was something over 250 miles.

Q. How was that service? A. Very good, very satisfactory.

Q. How long had the Allmanna Company been in operation, if you know? A. I don't know of my own knowledge.

1584 I found it in existence when I went there.

Q. Did it continue while you were there? A. Yes.

Q. Do you know about how many telephones they had? A. I can't recollect, but my impression is there were about 10,000.

Q. Was the service there more generally used by the people than here or less? A. Very much more in general use. Even the small stores had a telephone.

Q. Was it used in the hotels? A. Very extensively; in some of the larger hotels, in every room or every suite of apartments.

Q. Was it used in shipping, do you know? A. Yes; almost all the steamers running into Stockholm had a connection at the wharf, so that as soon as they arrived the wire was attached to the instrument on board ship, and it was in connection with the city or State or Kingdom.

Q. Had you any experience with the telephones in Norway? A. None except the connection through the Swedish telephone. I had occasion several times to telephone to Christiania.

Q. What distance was that? A. It is a little farther than from Stockholm to Gottenberg, the service I referred to.

Q. Was that line partly under water, or do you know about that? A. I should imagine that very few lines in Swe-

1585 den for any distance are operated except under water for some distance. The country is so cut up with lakes and water courses.

Q. How was the system in Stockholm laid; overhead or underground? A. Underground almost entirely, in cement tubes.

Q. From your answer, I suppose the Allmanna Company charges more than the government service? A. When I was

there there was a slight difference between the Allmanna and the Riks.

Q. Which was the larger rate? A. The Allmanna was a little more expensive for service.

Q. Do you know what the charge was for long distance talk to Christiania, for instance, or Gottenberg? A. Gottenberg, I think, was in the neighborhood of 60 ora for three or five minutes' conversation.

Q. That would be about how many cents? A. It would be about twenty cents, something like that. It would be sixty one-hundredths of 26.8 cents.

Q. Do you remember the charge to Christiania? A. I do not. I used it less frequently than to Gottenberg.

Cross-examination.

By Mr. WORTHINGTON:

Q. What knowledge have you, if any, as to the cost of construction of the telephone plant in Stockholm? A. None at all.

1586 Q. Do you know anything as to the cost of laying the conduits, erecting poles, or what wire costs? A. I do not.

Q. The cost of switchboards? A. No.

Q. Or telephones or any other part of the apparatus? A. No.

Q. What knowledge have you, if any, as to the operating expenses of the telephone system in Sweden at the time you were there? A. I have not investigated that at all.

Q. Do you know, for instance, what they pay their operators in the exchanges? A. Only from the report of the United States Consul at Stockholm, whom I instructed to look into it in order to report.

Q. You have no personal knowledge? A. No personal knowledge.

Q. Only what you got from reading something else you have seen? A. Yes.

Q. Do you know how many exchanges either of the companies of which you have spoken has in Stockholm? A. I have visited the central exchange.

Q. Of which company? A. Of the Allmanna. It is a matter of considerable interest always to strangers there, and I have seen them in operation. It is quite a large establishment, with about eighty or ninety girls.

1587 Q. Do you know how many other exchanges the Allmanna has in Stockholm? A. They have the Bell telephone, which is a sub-exchange. They have absorbed the line and instruments of the Bell Company.

Q. The Allmanna Company has absorbed the Bell Company, and the former exchange of the Bell Company is now a sub-exchange of the Allmanna Company? A. A sub-exchange.

Q. Do you know how many other exchanges the Allmanna Company has? A. No; I do not.

Q. Do you know how many exchanges the Government Company or the Riks Company, the one that operates the Riks telephone, has? A. No; I don't know how many.

Q. Do you know, in any of these exchanges, what kind of a switchboard is used, whether it is a multiple board or a divided board? A. No; I have no technical knowledge.

Q. Have you written anything upon the subject of telephones in Sweden or any other place? A. I wrote a report or letter to the department, forwarding the report of the Consul, which I have referred to.

Q. You simply forwarded the report of the Consul? A. Yes; and added to it what had come under my personal observation.

Q. Is that letter of yours in print, Major? A. The department has published the report, but I have never compared it with the original. I have read the report, and I believe it is substantially correct.

1588 Q. You think it is substantially a correct copy? A. Yes.

Q. When did you make that report? A. I think it was last January or last winter some time.

Q. Do you mean January of 1898? A. January of 1898.

Q. Do you know what were the wages of daily labor in Stockholm when you were there? A. No; I do not. As I say, the wages of the laborers was a matter investigated by the consul under my instructions, so that I did not look into it myself.

Q. Do you know whether or not subscribers to the telephone exchanges in Stockholm were required to pay something in the nature of an initiation fee when their service began, in addition to the annual rates? A. I am under the impression that there was, but never have I known it while I was there.

Q. Do you know that their subscriptions were usually for a period of years—five years, or something like that? A. Yes; they were for an extended period; but always with the proviso that if the party removed from the city, the contract was cancelled.

Redirect examination.

By Mr. HEMPHILL:

Q. Do you know whether the service is what they call the metallic service? A. I have no technical knowledge in reference to it.

1589 Mr. WORTHINGTON: Counsel for the defendant here give notice that they shall move to strike out all the

testimony of this witness on the ground that it is incompetent and irrelevant.

THOS. B. FERGUSON.
By the Examiner by Consent.

Subscribed and sworn to before me this ——— day of ———, 1899.

Examiner in Chancery.

The further taking of these depositions was thereupon adjourned, subject to notice.

1590 Testimony taken at Richmond, Virginia, March 27th, 1899, at the Office of the Richmond Telephone Company.

RICHMOND, VA., *March 27th*, 1899, 10 o'clock A. M.

Met pursuant to agreement.

Present on behalf of the complainants, Mr. HEMPHILL.
Present on behalf of the defendant, Mr. WORTHINGTON.
Also present, Mr. GUIGON, attorney for the Richmond Telephone Company.

JOHN C. ROBERTSON, a witness of lawful age, produced on behalf of the complainants, being by me first duly sworn according to law, testified as follows:

Direct examination.

By Mr. HEMPHILL:

Q. Mr. Robertson, please state your age, residence and occupation. A. My age is fifty; I live in Chesterfield County, Virginia, and I am president of the Richmond Telephone Company in Richmond.

Q. How long have you been president of this company? A. Since its formation in January, 1896.

Q. When did you commence operations? A. About the first of July, 1896.

Q. How many 'phones did you have in operation then when you began? A. At that time we had between five and six hundred. I wish to state, though, that we did not commence charging until we got a thousand 'phones, which was
1591 on the first of November, 1896.

Q. How many 'phones have you now? A. We have now about 1,300. We are putting them in and taking them out all the time.

Q. About 1,300? A. I believe about 1,300.

Q. Does that relate to the city of Richmond alone, or does it include your entire territory, the 1,300? A. It includes this exchange here. Of course we have some of them just beyond the corporate limit, but this exchange.

Q. Have you any additional exchange? A. We have a small exchange in Manchester which has about 85 'phones. That is connected with this, though, and is practically a part of the same exchange.

Mr. WORTHINGTON: Is it included in the 1,300? A. No, sir.

By Mr. HEMPHILL:

Q. State the general character of your clientage, whether it includes the business people or not. A. We have most of the business people in town.

Q. How about the banks and railroads and city offices? A. We have all the banks and all the railroads, some of the banks exclusively, and the city authorities exclusively.

Q. How far into the country do you reach? A. I don't suppose we go more than a quarter of a mile at any one point.

Q. Is that the longest wire you have from the ex-
1592 change? A. No.

Mr. WORTHINGTON: He means he goes a quarter of a mile outside of the city, I suppose, with some of them.

A. The longest wire we have in the exchange is up towards the Soldiers' Home, which is in the corporate limits. The city is not square. You can reach some points that are out of the corporate limits that are at least a quarter of a mile nearer the exchange than other places that are within the corporate limits.

Q. How far is the Soldiers' Home from here? A. I think that would be about two miles, isn't it?

Mr. GUIGON: It is two miles and a half, easily. I measured it.

By Mr. HEMPHILL:

Q. What kind of a circuit do you have, grounded or metallic? A. All metallic.

Q. Is your construction overhead or underground? A. Our construction is altogether overhead. We have large cables that run to every section of the city on poles sixty feet high and generally in the alleys. We have very few poles on the streets, and if you will observe (pointing out of the window), all those heavy cables which you see there are our cables. All that trash down below there and all the separate wires belong to other companies.

Q. All the single wires underneath, you mean? A. We are away up above the others. I do not mean the Bell Com-

1593 pany when I say that. I mean the telegraph company and other things. They have innumerable wires that run up there. The railroad company have wires running along there. You can see them there.

Q. The difference between your construction and the construction of the Bell telephone and the telegraph and other companies is, that yours are in cables?

Mr. WORTHINGTON: Do not lead.

Mr. HEMPHILL: It is so apparent.

Mr. WORTHINGTON: If it is so apparent there is the less necessity for leading.

A. Our wires come into the exchange altogether in cables. We have not a single pair of wires coming into the exchange except in cables, and we were required by the authorities here to use 60-foot poles in the business part of the town, so as to have our cables well above all other wires, and we were also required to go into alleys as far as practicable. This has had the effect of keeping us off from the principal streets.

Q. How many pairs of wires in those cables? A. Oh, they vary. The largest contains one hundred pairs, the smallest twenty-five pairs, according to the section of the city we have to run to.

Q. What kind of poles are they, what kind of wood? A. Chestnut.

Q. What is the best kind of pole to use? A. Chestnut, as far as I know, but we were required by the authorities to use chestnut, as they thought it was the best.

1594 Q. What has been the total cost of your plant? A. I don't know that I can give that. We put it out at contract and gave bonds for the construction. Of course I don't know what was the cost of it, but I know what it cost the company. Is that what you want?

Q. Yes, how much did it stand the company? A. It cost the company $75 in bonds for every telephone up to 1,200. Since then the company has been doing its own construction.

Q. What has it cost since then, since the 1,200? A. Oh, it has cost a great deal less. I don't suppose it costs us now more than $25 to put in a 'phone, because we have the poles up and we have vacant pairs of wires in the cables. There are very few places in the city for which we have to put up a pole now in order to put in a new 'phone. We put in 25 'phones last week without putting up a single pole. I mean 35.

Q. Can you estimate the cost in cash to the company? A. I cannot say exactly, but I am under the impression that with the cash in hand I could duplicate this entire plant for $75,-

000. I wish to say that material is very much cheaper now than it was when we commenced this exchange. The first 1,000 'phones we bought, we paid $17.50 per 'phone. I can get a better 'phone now for $10.50. The drops on the switchboards cost us $7 per drop. I can get a better one now for $4.

Q. Have you actually bought any phones for $10.50 each that were better than the original? A. Yes, we are buying them every day. I bought 24 last week.

1595 Q. Do you rent any 'phones yourself from any other company? A. No, sir.

Q. Do you buy outright? A. Buy outright.

Q. What 'phones do you use? A. We use the American Electric Telephone Company's 'phones, and the Western Telephone Construction Company's 'phones. We have now and then bought a few 'phones from other companies, such as the Phoenix Company of New York, and we have bought some few from them to test them, and there is a Swedish Company in Boston. I don't remember the name.

Q. The Ericcson? A. The Ericcson. We have bought a few from them sometimes.

Q. Are those 'phones for local use, or are they capable of long distance service? A. All the 'phones that we have we could talk to Chicago with them if we had the connections.

Q. What switchboard do you use? A. The Western Telephone Construction Company's, of Chicago.

Q. What is the capacity of your switchboard? A. Oh, we buy a hundred drops at a time. The switchboard is in sections and we buy a hundred drops at a time.

Q. What rates do you charge here? A. $36 per year for a business 'phone and $24 a year for residences and doctors.

Q. For residences and doctors? A. For resi-

1596 dences and doctors.

Q. Do you pay city taxes, or state and county taxes? A. Oh, yes, we pay city and state taxes.

Q. What do they amount to? A. About $3,000.

Mr. WORTHINGTON: $3,000 a year, you mean? A. Yes, sir.

By Mr. HEMPHILL: Do you furnish the city any 'phones free? A. No, we furnish them with all the 'phones they require at $10 a year, which I included in our tax list when I said $3,000. I can make that plainer, if you wish.

Q. Yes. A. We pay the city $2 per pole for each pole.

Q. Per annum? A. Per annum. We pay them $100 license tax.

Q. Annually? A. Annually. We have over 900 poles in the city, and our state taxes the first year were $1.50 per 'phone, but we succeeded in getting it reduced to $.50 per 'phone.

Mr. WORTHINGTON: I beg your pardon, did you say $2 per pole, or $2 per 'phone? A. $2 per pole. They tax us out of sight. Then the city has 25 telephones at $10 each. Of course they beat us $24 a year on those, and we consider that a tax, $24 a year on each one.

Q. Well, is there any other demand upon you of that kind? A. No, sir.

1597 Mr. WORTHINGTON: You mean that they consider there is a tax of $26, instead of $24, on each of the 'phones that you furnish to the city? A. Yes, sir, a tax of $26.

By Mr. HEMPHILL:

Q. What officers of the Association have you who are drawing salaries? A. The president and general manager.

Q. Just give the salaries of each one. A. The president up to the first of January drew $2,500.

Mr. WORTHINGTON: January 1st, 1899? A. Yes, sir.

Mr. HEMPHILL: Since that time? A. I wish to say that I proposed to give some of my time to something else, and since that time I reduced it myself to $1,200.

Q. Before that you had given it your time exclusively? A. Yes, sir.

Q. Who else? A. We have a superintendent, or rather he is known as General Manager. We have a General Manager who gets $2,400 a year. We have an attorney who gets a thousand dollars a year. Our cashier and bookkeeper gets $50 a month or $600 a year. Those are all the salaries. The others are wages.

Q. State whether you have any inspectors and so on, how many and what they get? A. Yes, we have a chief inspector who gets $50 per month.

1598 Mr. WORTHINGTON: State it by the year. A. $600 a year. Our inspectors run sometimes four and sometimes six. They get $40 per month, or $480 a year. We have linemen who get $40 per month.

Q. How many linemen? A. Four and sometimes six. Sometimes we have eight.

Mr. WORTHINGTON: Four to eight and $40 a month? A. Yes, sir; but generally we do not work more than two linemen. Then we have a construction gang. We pay the boss of that gang $50 a month. We pay his men from $1 to $1.50 a day. Sometimes he works 20, sometimes 5, sometimes 3 or 4. They work by the day.

Q. Do they do the outside work? A. They do the outside work.

Q. Does the gang you have spoken of do simply the new construction, or does it do the repairing and so on? A. They do the new construction, repairing the poles, and such things as guying them up and bracing them, such things as that. The linemen do the repairing of the wires. They keep the wires in order. The inspectors put up the new 'phones. The chief inspector stays in the office and connects up and attends to connecting the 'phones up.

Q. Does he put the new 'phones in the buildings of the customers? A. Oh, no; the inspectors carry them out and put them up.

Q. And connect them with the wires outside? A. No, the lineman runs the wires from the cable to the building.

1599 Then the inspector puts the 'phone in, wires up the building, puts in these little red wires that you see.

Q. Does that include your entire force, except that at the exchange? A. Oh, no, we have a collector.

Q. One collector? A. One collector.

Q. Do you pay him a salary? A. Yes,sir.

Q. How much? A. $60 a month.

Q. Any others now except those employed at the exchange? A. That is all.

Q. How many do you have at the exchange? A. Do you mean the girls?

Q. Yes, the operators, all told. A. Night and day?

Q. Yes. A. I can tell you in a few minutes. I have sent to have them counted. That matter is entirely in the hands of the General Manager. Sometimes he works a little more than at others. (Referring to a memorandum) There are 17 day girls and 11 night girls and 5 boys.

Q. What are their wages? A. They run from $20 to $25 a month, except the chief operator, who gets $36.

Q. Do you grade them according to efficiency or length of service or what? A. According to the time they have been here and their capacity.

1600 Q. How many drops does each one of them attend? A. 100.

Q. What can you say as to whether you have made any money during the time you have run this company? A. No, we have not made any money. We have paid expenses and kept up, but we could not make any money because we could not enforce our collections promptly. If we could have collected all of our money, we could have declared a dividend, but if a subscriber gets in arrears and we kind of push him for the money, it is a standing temptation to him to dispense with our 'phone and take the Bell 'phone at $30.

Q. Do I understand you that you have made nothing at all

over and above expenses, I mean over and above running expenses? I do not mean the construction. A. And the construction work, yes. We are doing our own construction.

Q. Where do you get the money to do it? A. Earn it.

Q. How much have you earned that you put into construction?

Mr. WORTHINGTON: One moment. I object to this question as very leading and improper, as it assumes what the witness has not yet stated to be a fact.

Mr. HEMPHILL: He says he puts money into construction which he earns.

Q. Just state whether you have made any money over and above expenses of operating and maintenance. A. Oh, yes, we are making some money all the time above operating and maintenance.

1601 Q. Can you tell me how much you have made or about how much? A. No, I cannot, but we make enough money to pay our own construction, to do our own construction work, buy new telephones, put up new poles when necessary, to extend the plant, and also to pay the expenses of a legal fight which we have had here. I mean the fight that we have with the Bell Company, of course, which expenses have been considerable.

Q. What kind of a fight. A. In the first place a fight to gain a foothold. Of course we had to employ canvassers. Then there was a long, hard fight with the council, in order to get the franchise we wanted, and while that was done before we commenced operations, all of that expense has been repaid from the earnings of the company; and also the long, hard fight that we had last year with the American Long Distance Telephone Company, which applied to the city for a franchise to build an exchange here in the city.

Q. What is the average income from your 'phones? A. Per month?

Q. Yes, or per annum. A. They run from $3,000 to $3,500 per month.

Q. That is the total, is it? A. Yes, sir.

Q. Can you give me how much it is per 'phone? A. It is about $32.

Q. $32 per annum? A. Yes, sir.

1602 Q. What is the expense per 'phone? A. Last year the expense, not to be exact, the expense of operating and maintenance was $23.61 per 'phone.

Q. What does that include? A. It includes the expenses of running the exchange and keeping it in proper condition.

Mr. WORTHINGTON: Operating and maintenance? A. Ope-

rating and maintenance. It included all salaries, all wages, and maintaining the exchange in good condition.

Q. Then the total income per 'phone was $32 per annum, and the total cost of maintenance and operation per 'phone was how much? A. $23.61.

Q. What became of the difference? A. Some of it was not collected. Some of it went on construction work. Some of it went into the legal fight before the council, I mean the fight before the council, and some of it went to pay the interest on our bonds.

Q. How many bonds have you out? A. We have now out about $95,000.

Q. What is the rate of interest? A. Six per cent.

Q. Have you retired any of your bonds? A. No.

Q. What were the total cash receipts per 'phone per annum last year?

Mr. WORTHINGTON: He has already given that, an average of $32 per annum.

A. I misunderstood that question. I think I said $32, didn't I?

1603 Q. Yes. A. Well, $32 is what the 'phones would average if we collected all.

Q. How much did you collect or how much did that average? A. Have you got that statement, Captain Guigon?

Mr. Guigon produces a statement or memorandum to which the witness refers.

Mr. WORTHINGTON: The proper proof is by the person who makes up the statement, not by the President, who does not know anything about it, except what he is informed by his subordinates.

A. (Referring to the memorandum) We collected $36,720.10. That included some that was due the year before. Of course you know we do not collect some of it until the time is out, from some people. But then I suppose it is as broad as it is long.

By Mr. HEMPHILL:

Q. You say it is as broad as it is long. In what sense do you mean? A. I mean that some which is due this year we will collect next year.

Q. Do you require people to pay in advance here? A. As far as we can, yes, sir, to pay in advance, by the quarter.

Q. And when they cannot, then what do you do? A. Well, then we do the best we can with the assistance of our attorney.

Q. What is your net income, deducting the cost of maintenance and operation from your cash receipts? A.
1604 We have not generally kept these separated, because, as I said, we mixed our construction account with the maintenance account. For instance, we have our construction gang putting up new poles, stringing wires, and such things as that, and the next day we have them perhaps straightening up poles, working on the cables and such things as that. So it is hard to keep our construction account separate from the maintenance. For two months in this year our construction gang was busy repairing the damages caused by that heavy sleet and snow storm, the breaking of our cables, caused by the ice in the river, and such things as that, breaking the poles off, and the damage was immense. In fact, we doubled our construction gangs during that time. I wish to explain that this company is in the hands of a few people. All the stock and bonds are held together. That is, the bonds are held by our largest stockholder, and it is not necessary for us to be so exact in separating the different accounts.

Q. Can you give me an idea whether your receipts in cash have exceeded the operating and maintenance expenses? A. Captain, take a pencil and figure it out, will you. We had last year 1,229 'phones at an average cost of $32.

Mr. WORTHINGTON: What is that? A. 1,229 'phones at an average cost of $32.

Mr. WORTHINGTON: At an average cost— A. At an average rental cost of 32.68. That makes $40,167; less amount paid in advance in 1898 on 1899 rentals, $4,738.52, making the gross income for 1898 $35,428.48.

By Mr. HEMPHILL:

1605 Q. And you had how many 'phones? A. 1,229.

Q. 1,229 'phones. What was the average cost of maintenance of those and the operating expenses? A. $23.61.

Q. Do you know how much money you have spent in construction from the revenues of the company? A. I did not give that. What do you mean—altogether?

Q. Yes, I mean from the revenues of the company, altogether or at any one time. A. Oh, we spent for construction work about $500 a month, sometimes more, sometimes less, I mean running new wires, buying poles, buying new wires, and buying telephones.

Q. Where does that money come from? A. Earnings. We never have borrowed any money for expenses, never have borrowed a dollar for expenses, put that down; except that at one time I borrowed $1,000 for taxes and paid it back in 60 days.

Q. Do you know how many new 'phones you have put in

this year? A. No, I could not give the exact figures now, but we have taken out a good many 'phones this year on account of non-payment, people getting behindhand, and we took them out, but we have put in right straight along more 'phones than we took out, so that it is necessary for us to buy new 'phones continually. I bought 24 'phones in February, and I have ordered 12 more.

1606 Q. State whether the collections from 'phones are increasing or diminishing in the average? A. Oh, they are increasing. The people are paying better.

Q. What does the improvement amount to in that regard? A. Well, we do not have as much trouble in collecting as we did. We do not have so many people get in arrears. That is caused principally by the fact that so many business people have our telephones that a business man now can hardly afford to be without our 'phone, and if we take a 'phone out the party generally comes around and pays the arrearage and orders the 'phone put back. Six months ago that was not the case. If we took a 'phone out for non-payment the party would take the Bell 'phone then.

Q. You have said something about construction in part being charged to maintenance, I believe? A. Yes, sir.

Q. Is any part of maintenance charged to construction? A. No, sir; never.—Oh, wait. Since the first of January some part of maintenance would, I suppose, be charged to construction for the reason that our constructing gang has been used to repair the damage caused by the sleet.

Q. That would be construction charged to maintenance. If you use your construction force for maintenance purposes, that of course would be charged up to maintenance.

Mr. WORTHINGTON: Will you allow me to object to that, and to suggest that the witness possibly knows more about it than we do. Anyhow, you have no right to state what you understand to be the fact.

1607 Mr. HEMPHILL: I gathered that from what he said a little while ago.

A. That would be charging maintenance to construction account, but in no case has construction account been charged to maintenance.

Q. That is what I understood you to say. State whether there is any other telephone company in the city. A. There is the Southern Bell Telephone and Telegraph Company.

Q. Do you know whether it is a licensee of the Bell Telephone Company? Is it the American Bell? A. No, it is the Southern Bell Telephone and Telegraph Company.

Q. What instrument does it use? A. They use an instru-

ment called the Law system. I don't know the instrument that they use. It is different from any that I have ever seen North, but it is a Bell telephone.

Q. Do you know how many 'phones they have in operation here? A. No, I do not.

Q. What are their rates now? A. As far as I know $30 for business and $18 for residences.

Q. What do you men by "as far as you know?" Is that what they charge generally? A. That is what I am informed.

Q. What were their rates before your company started here? A. $48 and $60 for the first half mile.

Q. $48 for what? A. $48 for residences and $60 for
1608 business for the first half mile. For the next half mile, $72 for business. I don't know what it was for residences. And beyond that I don't know what they charged, whether $80 or $100. Their rates, so far as I could learn, were special. I wish to state that they had very few 'phones out from the city, and I am very sure that they did not have as many then when they had the city to themselves as they have now.

Q. State whether you have always been able to pay the interest on your bonds or not? A. We have not. As I have said, the bonds are held by our largest stockholder, and we pay him such money as we can from time to time, such money as we can spare from time to time, and we are now somewhat in arrears on our interest.

Q. How much? A. I can't say. We have not had a settlement with him for some time, but I do not think we will be more than $5,000 behind. With no construction expenses, we could pay the interest on our bonds, and as I said before, if we could collect all that was due us promptly, we could pay a dividend.

Q. You have stated that the construction money came from these bonds and from the earnings of the company. Did you derive construction money from any other source? A. No, sir.

Q. Just those two sources? A. Yes, sir.

Q. You have stated that there are $95,000 of bonds out? A. Yes, sir.

1609 Q. State which company furnishes the State and City offices here with 'phones. A. Our company, with the exception of the long distance. The American Telephone and Telegraph Company, the Long Distance Company, I think has a telephone in the Governor's office.

Q. Is that the same company or a different one from the one operating in the city here? A. Well, now, that is too hard for me. Sometimes they claim it is and sometimes it is not.

Q. Do you know whether that was put in as a bonus to the

Governor's office or whether it is paid for? A. No, sir; I do not. When they were applying for a franchise here they stated that it was entirely separate and distinct from the Southern Bell, but failing to get a franchise they connected up all the same with different cities and called it the Southern Bell.

Q. If it was not for this other company would you be able to collect any better than you are doing?

Mr. WORTHINGTON: I object to that as asking the witness to make a guess, which it is not shown he is any better able to make than anybody else.

A. Never having tried it, I don't know, but I think I could.

Q. Inside wiring and wires goes to what expense? A. Inside of the building?

Q. Yes. A. That is construction.

Q. Suppose you go to a building and put a wire inside for putting up a 'phone? A. We charge the wire to con-
1610 struction account and the putting it in goes to maintenance, because a man on the regular maintenance account does it.

Cross-examination.

By Mr. WORTHINGTON:

Q. What is the capital stock of the Richmond Telephone Company? A. $300,000.

Q. Divided into how many shares of what par value? A. 3,000 shares of $100 par value each.

Q. Has that all been issued? A. Yes, sir.

Q. Has anything been paid on account of stock? A. We paid franchises and such things as that.

Q. I beg pardon. A. We issued the stock if full payment for the franchises and charters and the money that had been expended in getting subscriptions, and general work performed.

Q. Then none of the money that was due or paid on account of stock subscriptions was applied in building the plant? A. None.

Q. You did that entirely with the money you raised on bonds? A. Yes, sir.

Q. Except what you say has come from your earnings? A. Yes, sir. I wish to say, to make that plainer about that bond business, I mean about the bond issue, that when we
1611 got the 1,200 'phones we cancelled a contract for construction which we had and we are now doing it all ourselves. We do not issue any more bonds.

Q. You have $95,000 in bonds outstanding? A. Yes, sir.

Q. Did you sell the bonds at par or more or less than par?

A. As I said, I made a contract with one party to do the construction work and furnish everything for bonds at the rate $75 per telephone. Of course he took the bonds at par.

Q. So that the original 1,200 'phones were paid for by the $95,000 in bonds? I mean your plant with 1,200 'phones was paid for by $95,000 in bonds? A. Yes, sir.

Q. And you now have in excess of that 1,200 how many 'phones? A. As I said before, we have about 1,300 'phones now.

Q. Then you have added about 100 'phones? A. Yes, sir.

Q. To the number which you paid for with the bonds? A. Yes, sir; but I want to explain one thing about it, and that is that when we first started a great many people took telephones with no intention whatever of paying for them, just to help along the new company, and of course we had to pay for those, and when we began business we had to drop those out by the dozen.

Q. Still you have a telephone exchange plant here with 1,200 subscribers which you paid for with $95,000 in bonds? A. Yes, sir.

1612 Q. And since then you have added only about 100? A. That is 100 in addition to those that we have taken out.

Q. And as I understand you, most of the 'phones that you have put in since you constructed your 1,200 originally have not cost you so much, because you had the poles up and had surplus wires? A. No, we had the poles up and surplus cables, and they have not cost us very much.

Q. Well, about how much have those extra 100 'phones cost you? A. As I said a while ago, they cost about $25 per 'phone; I mean that in addition to the cost of the 'phone itself, which is $10.50, the amount we pay now.

Q. Very well. How do you obtain the figures which you have been giving us as to the cost of construction and the various items of operating and maintenance? A. We get them from our books.

Q. Who is your bookkeeper? A. Mr. Maupin.

Q. He is also your cashier? A. No, sir; he is not the cashier. We have a young man named Mr. Cherry. Mr. Maupin only comes up once or twice a week in the evening and writes the books up. Now about the cost I wish to state that all bills are paid by me. All purchases are made by me, and in that way I keep up with every detail of the financial department of the company.

Q. Still when you want a summary of the expenses for a month or a year, you get it from your books? A. Yes,

1613 sir.

Q. You do not keep the books, of course? A. No, sir.

Q. Are Mr. Maupin and Mr. Cherry here? A. Mr. Cherry is here. He simply keeps, as I said, the cash account, the cash receipts, and that is all.

Q. And Mr. Maupin comes up once or twice a week and posts the books? A. Mr. Maupin comes up once or twice a week and posts the books.

Q. Is he here in Richmond? A. Yes, sir.

Q. Do you know of any reason why these gentlemen should not be produced and examined and their books shown to us, to show these results, instead of putting you upon the stand to testify to the information you get from them? A. I know of no reason in the world why it should not be done, but I wish to say that the statements which I have made—that most of the statements which I have made, were from a statement that has been prepared by Mr. Maupin, our bookkeeper, as official.

Q. You rely upon it as correct and it suffices to determine your judgment about these matters? A. Yes, sir.

Q. How many subscribers had you six months ago? A. That was in November.

Q. Well, about six months ago. You have referred to some differences between the situation now and what it was six months ago, and I am going into the details of it. A.
1614 All right. I think we had about 1,200.

Q. And you have now about 100 more subscribers than you had then? A. About a hundred more subscribers than we had then, but we have been getting in mostly more business and we have been gradually shaking out those residence 'phones that, as I say, were put in by people that had no intention whatever of paying us, but took them just to help the new company along.

Q. How many 'phones have you taken out from one cause and another from your system since you began business nearly three years ago? A. I cannot tell you exactly, but I think over two hundred.

Q. Why is it, if you know, that the city authorities are using your telephone exclusively? A. Because the Bell franchise here has been repealed by the city and they have been ordered to pull down their poles and wires and leave the city. They have got out an injunction from the federal court to prevent the city from interfering with them, and that case is now in the Supreme Court, and of course the city—

Q. The city wants to conform to the law, or what it understands to be the law? A. Yes, sir.

Q. That is so as to the State officials, isn't it? A. No. They merely took our 'phones from the fact that they were more friendly with home people than they were with foreigners.

Q. The stockholders, the persons who hold the stock
1615 and bonds of your company, are all residents of Richmond? A. All in Richmond, yes, with the exception of a few bonds that are held in Chicago.

Q. And among your leading citizens? A. I say with the exception of a few bonds held in Chicago.

Q. These stockholders and bondholders are among your leading citizens here, men of influence in Richmond? A. Yes, sir.

Q. You, as president of this company, have taken considerable interest in this controversy with the Bell Company in endeavoring to get them excluded from the city, have you not? A. Well, now, what controversy do you allude to?

Q. I mean the legal controversy. A. I had nothing to do with it.

Q. I don't mean that you have brought any litigation, but as a matter of fact you have taken an interest in it, have you not? A. I have felt an interest, but I have taken no interest whatever, could not do so. There was no way for me to do it. It is altogether a fight between the city and the Southern Bell Company. The home company has taken no part in it whatever.

Q. The Southern Bell Company is a company which operates telephone exchanges in a great many of the southern States, is it not? A. Yes, as far south, I think, as Louisiana.

1616 Q. The Richmond exchange is just one of a great many exchanges that they control in the South? A. Yes, sir.

Q. Did your company take any part in the litigation you have spoken of for keeping out of this city the American Long Distance Telephone Company? A. We took a very prominent part in trying to defeat them before the council.

Q. Why did you do that? A. There was no litigation—

Q. Why did you do that? A. Because if they had succeeded in getting a franchise here it was their intention, as expressed before the council, to build a local exchange. That would have been the same thing as giving the old Bell Company a new franchise.

Q. What was your objection to that? A. Well, we did not wish to have that kind of competition.

Q. You say that your subscribers are all furnished with the metallic system? A. Yes, sir.

Q. Do you have double wire for each subscriber or do you use the common return system at all? A. We have a double wire for each 'phone, except a few in the northwest, where we have a common return, but we are getting them off as fast

as possible, as the service is very unsatisfactory. We have not half as many on now as we had twelve months ago and within four or five months I think we will have them off.

Q. Do you have any ground circuits at all? A. No,
1617 sir, and no party lines.

Q. What kind of wire do you use on these metallic circuits? A. In our cables we have copper wires. Between the cables and the house we use a steel wire No. 14 B. B., as we call it, purchased of Roebling's Sons of Jersey City.

Q. How many miles of that kind of wire have you in use? A. What kind?

Q. The kind I have just mentioned. A. Do you mean the steel wire?

Q. Yes. A. I could not possibly state.

Q. Have you anybody here in your office who can tell? A. No, sir; it will take some time to get that information. I suppose several hundred miles.

Q. Would you mind getting me a piece of that wire that I may see it? A. Yes, sir; I will do so.

Q. How far do your cables extend from your exchange? A. That is an indefinite question. We have some which are a great deal longer than others. One of those cables extends down two blocks and then we start out and get business 'phones. Then we have them a mile and a half long. Sometimes a half a mile. We have them going down on Carey street not more than five blocks. We have different lengths.

Q. In driving around the city this morning I noticed
1618 a great many poles with apparently hundreds of wires on them and not any cables. Do any of them belong to your company? A. I think not—unless—no, I think not. Most of our wires are in the alleys.

Q. I thought I saw a great many of the alley lines which had dozens of wires strung on them, not cables. Is not that so as to your system? A. It depends on what part of the city you were in. If you went up beyond the end of the cables you would find where all the wires came out and connect, but we have no wires of any kind within a quarter of a mile of the exchange. We have no wires at all that come into the exchange except cables.

Q. Haven't you poles carrying from fifty to seventy wires with no cables on them at all? A. Not except beyond the end of the cables.

Q. That is what I meant to bring out. You do not use the cables up to the place where the wire leaves the line to go to the subscriber's house? A. Sometimes the cable goes half a mile and sometimes a quarter of a mile. We go to the end of the cable and there we put a cable box. Then we start out

go all around the neighborhood. Sometimes we have to bring a pair of wires back on the same pole in order to reach some telephone.

Q. You cannot give either the total length of the cable that you have on poles nor the total length of the wires outside of cables? A. I cannot do it now, but I can get it for you.

Q. I want a piece of the wire you have spoken of as
1619 being in use. A. (Producing a piece of wire) That is it.

Q. I understood the boy who got it to say that was not it. A. He said that was not the B. B. wire, but that is what we bought last.

Q. Now, I would like to cut off a piece of this wire and offer it in evidence. A. All right; I will cut you off a piece.

Q. A piece six inches long is enough. A. I will cut off a piece.

(Witness here cuts off a piece of the wire referred to and counsel for defendant offers the same in evidence. It is herewith filed, marked Exhibit Robertson No. 1.)

Q. What did you say as to the length of poles that you used in your system? A. The poles in the business section of the city are sixty feet.

Q. Does that mean sixty feet long when you buy the pole or sixty feet from the ground to the top? A. The poles are sixty feet long and we put them in the ground from six to eight feet.

Q. That leaves the pole something over fifty feet above ground? A. Yes, sir.

Q. And how many cross-arms do you have on your poles? A. It depends on the number of wires.

Q. Well, about how do they run? A. We cannot av-
1620 erage those. We would have to count them up.

Q. What is the maximum number of cross-arms? A. I cannot give you that, because, as I say, the poles that we have cables on as a general thing have only two cross-arms, but when we string wires on them we have twenty or thirty pairs of wires.

Q. Haven't you as many as eight or ten cross-arms? A. I cannot say. I want you to understand that I mean that construction department is not under my immediate supervision. In some places we may have—no, I don't think we have eight or ten cross-arms on any of the poles.

Q. Are there not places in the city where your wires are not over twenty-five or thirty feet above the ground? A. Oh, yes, but in the business section of the city we are required to have sixty-foot poles.

Q. What do you mean by the business section of the city? How far does that go from your exchange? A. The business section is in the section that has stores. Then outside of that we get down to fifty-foot poles and forty-foot poles.

Q. Can you tell me approximately how many poles of each height you have, each of these several lengths? A. I cannot, but most of our poles are sixty feet.

Q. Does the sixty-foot regulation apply to poles in alleys? A. Yes, sir.

1621 Q. Can you in any way give me the boundaries of what you call the business section, bounded by the streets which enclose it? A. Yes, sir; between the James River on one side and Broad street on the other side, and below about 20th street.

Q. And about 20th street east or west? A. That means east. Then up Main and Carey to Seventh, Seventh up to Broad, then from Broad out to three or four squares beyond First.

Q. When you speak of Seventh street, do you mean Seventh street east or west? A. Seventh street east.

Q. How far on an average is it from James River to Broad street? A. About seven squares.

Q. And how many squares long is the business district the other way that you have described? A. From 20th street up to Seventh on Main and Carey, and on Broad from 20th street up to about four squares beyond First.

Q. How many blocks would that be in all? A. Between 20th street and Seventh is thirteen blocks on Main and Carey. On Broad it is about twenty-four or twenty-five blocks.

Q. Those boundaries would not include the part of the city where the Jefferson Hotel is situated, would they? A. No, sir; the Jefferson Hotel is not in the business section of the city.

1622 Q. What kind of wires do you use in your cables? I know you use copper wire, but what description? A. We use a copper wire enclosed in some kind of medicated paper, wrapped in pairs. Our cable runs from 100-pairs down to 25-pairs.

Q. What is the size of the wire and who makes it? A. I don't know. I will try to find out.

Q. What is the cost of it? A. That is according to the number of pairs. A twenty-five pair cable costs more in proportion than a hundred-pair cable.

Q. What does the twenty-five-pair cable cost? A. I would have to find out. I cannot at this time give you the amount, but I think it is 30 cents a foot, or was at the time I bought.

Q. How would you find it out if you wanted to find out for

your own information? A. I would look at the bills, look at the receipts.

Q. What do you pay for the steel wire of which a specimen has been put in evidence? A. We pay 3½ cents a pound, but that varies, sometimes 3¾ and sometimes 3¼.

Q. What length of wire would we have in a pound about? A. I think about one hundred pounds to the mile, but as I said, those figures are not exact, because I do not exercise immediate supervision over the construction of the company. The superintendent has charge of that and he orders so much wire and I get it for him, but I have never kept an account of the mileage per pound.

1623 Q. What do you pay for these poles that you use? Take the 50-foot poles, what do they cost you? A. They cost us $6.50 apiece, delivered at the depot.

Q. What do they cost set in the ground, ready for the cross-arms? A. I cannot give you that, as our sixty-foot poles were all put in the ground by the construction company.

Q. Well, as to the 50-foot poles, what do they cost set in the ground without cross-arms? A. In the same way, I have not put up any 50-foot poles. The poles which I have been putting up are away out in the extreme limits of the town.

Q. And what height are they? A. I buy 35 and 40-foot poles, but I do not keep an account of putting them in the ground, the cost of each pole, because our construction gang are putting them in.

Q. What do you pay for the poles? A. We pay $1 for a 30-foot pole at the depot in the country and $1.50 for a 35-foot pole and so on up.

Q. Mr. Robertson, haven't you some 35-to-40-foot poles in the alley between Broad and Grace streets, running from Second street east several squares easterly? A. I don't know, but I don't think so.

Q. Is that within the boundary of the business portion, as you have described it? A. No that is in the residence portion.

Q. That is in the residence portion? A. Yes, sir.

1624 Q. Does not that line supply customers in the business portion? A. Yes, sir; but that is not what we call the business portion of the city, it is in the residence portion, between Grace and Franklin.

Q. Haven't you some 40-foot poles on Third street east, running from Broad to Franklin, two squares? A. Probably we have.

Q. That is in the residence portion, too, it is? A. That is in the residence portion.

Q. Are you acquainted with the system of bookkeeping

which is in use in your office, so that you could describe it? A. No, I am not a bookkeeper, never did any of that kind of work.

Q. Do you know, of your own knowledge, how the money which is spent in putting up poles and installing the telephones in the subscribers' offices, is entered in the books? Do you know of your own knowledge? A. Yes, sir; because I instruct them as to each bill when it comes in, as to whether it shall be charged to maintenance, construction, shop pay roll or inspectors.

Q. Then you know how you instruct it to be entered, and you assume that it is entered according to your instruction? A. I know that it is entered because I examine the books from time to time, and see that the proper entries are made.

1625 Q. Well, when you install a telephone and its appurtenances in a new subscriber's office, tell us what entries are made in the books, of the expense? A. If we put a telephone in without any expense beyond running a short wire, for instance where a telephone may have been in the house adjoining, and been taken out, we simply charge that to maintenance. That is we make no extra charge, as we use no material. Where we use no new material we make no extra charge. We just simply charge the man up with the telephone and credit the company with the new telephone; but when I buy a dozen telephones I charge them to the construction account. When I buy two or three or four miles of wire I charge that to construction account.

Q. Without regard to how it is subsequently used? A. Well, the wire is used in the construction account. We do not use any wire except in construction.

Q. All the wire you purchase is charged to construction, and it is put up by the construction gang? A. Well, if it is a long wire we run what we call a drop, which we run by the construction gang, but you see frequently the wire had already been run from the end of the cable to perhaps the adjoining house or one or two houses near, and then we just simply make our linemen who are regularly employed go out there and attend to the connecting. Then there is no charge.

Q. What is the total amount of your construction account up to this date according to your books? A. I could not give you that exactly.

1626 Q. Can you give it to me approximately?

(Witness here examines a paper.)

A. I cannot give it to you approximately, but I can find it out for you.

Q. How would you find out? A. Find out from our books.

Q. Would you mind sending for the book now, in order that we might see it? A. I will look myself.

Q. I would like to see the book, Mr. Robertson. A. I don't know whether I would like to have the attorney of the Bell Company inspect our books. I think you will have to have my word for it.

Mr. WORTHINGTON: I would not for a moment suggest that your word is not to be relied upon, but I think we have a right to go to the books and look at them as to all matters you have been testifying about, and I am going to ask that privilege.

Mr. GUYGON: As the attorney for this company I shall protest against it.

Mr. WORTHINGTON: Might I ask why?

Mr. GUYGON: Because in my judgment it is proper to protest, and improper to show to counsel for the Bell Company the books of this company.

Mr. WORTHINGTON: I would state for your information that I am not counsel for the Bell Company, but I am counsel for the defendant in this case, which is the Chesapeake and Potomac Telephone Company. It is one of the Bell licensee companies.

1627 Mr. GUYGON: Any protest I have made I will withdraw as far as Mr. Maupin is concerned, because Mr. Maupin is the bookkeeper, and he can obtain the books. He is a bookkeeper and Mr. Robertson is not.

The witness, Mr. Robertson, left the room and returned with a memorandum to which he referred.

A. From the first of March, 1898, to the first of January, 1899, we spent $4,831.28 in construction.

Q. My question is what is the total amount of your construction account to date. A. That was the time that we took hold of the construction work, March 1st, 1898. You see up to that time we gave bonds for the construction work.

Q. How many telephones did you have on the first of March, 1898? A. I could not tell you exactly, but I think about 1,150 in actual use.

Q. Can you get the exact figures for me? A. Yes, sir; I can.

Q. How many did you have on the first of January, 1899? A. 1,229.

Q. Now I will have to trouble you to give me the exact figures for the first of March, 1898. A. Our books do not show how many 'phones we had in on the first of March, or on the first of any other month, except at the end of the year,

1628 as we do not balance our general account until the end of the year. We are taking out some days and some days we are putting in.

Q. I understood you to say on your direct examination that your system comprised 1,200 subscribers when you took charge and began doing your own construction? A. Well, what I mean is that we had to pay for about 1,200 telephones. A good many of those had been taken out because when the construction company put in a telephone he was entitled to his bond whether that man paid his telephone rent or not.

Q. There had been 1,200 telephones put in then up to the first of March, 1898? A. Yes, sir.

Q. And on the first of January, 1899, you only had 29 in addition to that? A. We only had 29 in addition to that because we had made good all of our losses of poor subscribers, and we were getting on a better and more solid basis. I wish to state about the poor subscribers that it was understood here among the business men that they were not to commence paying for the service until we got a thousand 'phones in use and operation, and that in order to get the full thousand we were not so particular as to the class of subscribers that we were getting, and it took us some time to take out all the bad ones.

Q. Can you tell me whether on your books there is kept anything in relation to a depreciation account? A. No,
1629 sir, there is no depreciation account. That is covered altogether by the maintenance account, as our exchange is kept in first class condition all the time. If a piece wears out we take it out and replace it.

Q. What proportion of your telephones now in use are those which were manufactured by the Western Telephone Construction Company of Chicago? A. Oh, I suppose nine-tenths.

Q. And the new telephones you are buying now, do you buy them from that company, mainly? A. We buy some from them, and some from the American Company.

Q. What do you pay the Western Telephone Construction Company for the telephones which you buy from them now? A. $10.50 each.

Q. That includes what? A. That includes the telephone and batteries.

Q. What constitutes a telephone? A. Now you are too hard for me. I am no telephone manufacturer or expert. We buy the telephones and they come here complete. That means a complete set of instruments.

Q. Does it include battery cells? A. Yes, sir.

Q. How many? A. Two.

Q. Do I understand you to say that with those telephones you could talk to Chicago if you had the connections?
1630 A. Yes.

Q. What test have you personally made in regard to

that mattter with one of those Western Telephone Construction Company telephones? A. None personally, but we have had it done between Philadelphia—

Q. I shall have to object to your stating what somebody else has done, and told you. A. I have never talked to Chicago over a Western Telephone Construction Company's telephone.

Q. What is the longest distance over which you actually use those telephones in your system here? A. About seven miles, I think.

Q. How many telephone exchanges has the Richmond Telphone Company? A. One.

Q. One here in Richmond and one in Manchester? A. They do not own the one in Manchester.

Q. Who owns that? A. That is a separate company.

Q. The figures which you have been giving us then have not included that exchange at all? A. No, sir.

Q. Have you had any auxiliary exchange here in Richmond, in your company? A. We have what is called a sub-station.

Q. Where is that? A. That is located on Broad street between Second and Third.

1631 Q. How far is that from your main exchange? A. I think it is three-quarters of a mile.

Q. Are you using that sub-exchange now? A. Yes, sir. It is not a sub-exchange. It is a sub-station.

Q. Well sub-station. I wish you would describe what you mean by sub-station. A. I mean that we have a board with 100 drops on it, and for the accommodation of the people who live up in that part of the town. If a party in that part of the town wishes to call someone else in that part of the town who is connected with that switchboard, they do not have to call up the central office.

Q. How many subscribers are now using that exchange? A. About 80.

Q. And when any of those eighty wish to communicate with any of the others among the 80 they do it through that exchange alone? A. Yes, sir.

Q. But if they wish to communicate with any other of your customers then they have to do it through the main exchange? A. Yes, sir.

Q. And so when anybody in the main exchange wishes to communicate with any of those eighty subscribers they have to go through two exchanges too? A. Yes, sir. But that station was put up as an experiment, and we find that

1632 it is not satisfactory and we propose to do away with it.

Q. And have all your customers communicate with the main exchange directly? A. Yes, sir.

Q. Why is that unsatisfactory? A. Because a great many of our customers in that part of the town complain of being delayed when they wish to communicate with someone not connected with that sub-station, and then the operators are off by themselves, and we have not the same facilities for repairs that we have in the main exchange. What I mean is this, that if a drop would get out of order or anything at the switchboard, we have a chief inspector here who can remedy it immediately. In case of accident or breakage up in that sub-station the girl there has to call down to the main exchange.

Q. Your experience then is that it is better for the company and better for the subscribers to have them all connected directly with the central exchange, and not have sub-stations? A. That is my experience, and if I had it to do over again I would not put in that sub-station.

Q. Is it more or less economical in the construction of a telephone exchange, to have one exchange or different sub-station for the outlying districts? A. It costs a little more at first in building it, to have them all in one exchange, because you would have to bring eighty pairs of wires down to
1633 this exchange from that one in order to connect it with this, whereas we bring eighty pairs of wires into that exchange and we have only between five and ten trunk lines to connect the two exchanges.

Q. Because those eighty lines are never all in use at once, and you can get along with a much smaller number of wires in connecting them with the main exchange? A. Yes, sir.

Q. What is the average distance from your central exchange of the subscribers who connect with it directly? A. Oh, I have never calculated it. I don't know. I have not the least idea.

Q. Cannot you even approximate it? A. Oh, it would be guesswork if I answered.

Q. And there is no record kept in your office from which it could be ascertained? A. No, sir; we have some 'phones within forty feet and some two miles, two or three miles.

Q. How many telephones have you that are more than two miles from your exchange? A. I don't suppose we have more than thirty or forty.

Q. Is your exchange situated in the heart of the business section? A. I think it is, about.

Q. What proportion of your 1,229 telephones are business telephones? A. Over two-thirds.

Q. What is the limit of distance of the business tel-
1634 ephones from your exchange? A. Oh, we cannot keep an account of that.

Q. I mean how far from your exchange is the farthest part

of the business section. A. That would not answer your question, because if a man kept a grocery store up in the extreme limit of the town that would be called a business 'phone, or if he had a lumber-yard outside of the town that would be a business 'phone.

Q. Still I suppose the bulk of your business telephones are in what you have described as the business district? A. Oh, yes.

Q. About what proportion of them? A. What proportion of the business 'phones are in the business district?

Q. Yes. A. I suppose ninety per cent.

Q. Why did you reduce your own salary from $2,500 to $1,200? A. Because we employed Mr. McClure, who had been a general manager of the Southern Bell Telephone Company for some years, and I found that with his knowledge and experience I could safely leave a great many matters with him that had been in my hands before. Therefore I could give a great deal of my time to other matters.

Q. Is he the superintendent or general manager to whom you pay $2,400 a year? A. Yes, sir.

1635 Q. Did he come with you on the first of this year? A. He came with us the first of September, 1898.

Q. The first of September? A. I will find out the exact time.

Q. Some time last fall? A. Yes, sir.

Q. That is near enough. Prior to that did you have any superintendent or general manager? A. We had no general manager, but a superintendent.

Q. What did you pay him? A. We paid him $1,200.

Q. Then you added $1,200 to that salary and took off about the same amount from your own? A. Yes, sir, took off about the same amount from my own, and added it to the salary of the manager. The young man that we had here had had no general experience, and I had to exercise immediate supervision over every detail of the business before Colonel McClure came.

Q. Are those annual salaries payable monthly, quarterly, or how? A. Monthly.

Q. Has your salary for this year been paid? A. Yes, sir.

Q. Has Colonel McClure's? A. Yes, sir, we pay those salaries at the end of every month.

1636 Q. And they have been kept up, have they? A. Yes, sir.

Q. As to the cashier and bookkeeper? A. All the same way.

Q. And your inspectors and linemen, have they been paid? A. They are paid every two weeks, yes, sir.

Q. And they have been paid up to date, have they? A. No, we owe them for the last pay-roll.

Q. What was the last pay-roll? A. Pay-day was the 15th.

Q. The 15th of this month, the 15th of March? A. Yes, sir.

Q. Why were they not paid? A. Because we had an extra expense of five or six or seven or eight hundred dollars from the sleet and snow storm, and our collections also were bad, and we fell somewhat behindhand in our collections as well. I will state that for two weeks we could not give any service of any consequence, and consequently we could not ask a man to pay a telephone bill if his telephone was out of use, and we fell behindhand two pay-rolls, but I will be up this week. I expect to pay the operators this month, and for this pay roll, either to-morrow or the next day.

Q. How much extra expense did you say this storm put you to? A. Oh, it cost us between $600 and $1,000, actual money expended, besides the loss of time and the deduction or rebate in the bills to people whose 'phones were out of
1637 use, we deducted two weeks from the bill.

Q. What proportion of the 'phones were put out of use by the storm, for a short time? A. I reckon that fully fifty per cent. of our 'phones were damaged some, that is by the sleet breaking the wires, by the snow, and by the snow and wind storm; by the throwing of the ice from the houses on the wires, by the crossing of our wires by other wires that had fallen. Sometimes the Bell Telephone wires would break, and they would fall across our wires and make a great many crosses. The wires of the Richmond Railway Company would break and they would fall across our wires, so in that way I reckon during the month fully fifty per cent. of our 'phones were somewhat damaged. Sometimes thirty or forty of our wires were just simply bundled up by their wires falling upon them.

Q. Was the storm of which you have been speaking the blizzard that occurred on the 13th of February last? A. Yes, sir.

Q. Do you mean to say that all that damage was repaired for from $600 to $1,000? A. Yes, sir.

Q. Did that include the cost of the wire which you had on hand and which you used in those repairs? A. We did not have to use much wire, but had simply to straighten out and untangle wires, and straighten the poles up.

Q. Then your financial condition was such that the
1638 extra expenditure of this sum of money required you to pass your pay rolls for a couple of weeks? A. Yes, sir.

Q. Including also your operators, I believe? A. Yes, sir.

Q. You are behind with them? A. That is what I mean, but I am not altogether behind with them, in this way. There

are a great many of them who needed their money who have been paid off, but I mean that I have not paid the full pay roll.

Q. Did the storm break down any of your cables? A. Yes, sir; it pulled one small cable in half.

Q. You have seventeen operators at present? A. Yes, sir.

Q. How many operators' positions have you at your switchboard? A. Thirteen.

Q. What do the other four do? A. I generally have relief operators, so we keep four extra on hand.

Q. What kind of switchboards do you use? A. The Western Telephone Construction.

Q. Is it the original switchboard which you purchased from that company when you started business? A. Yes, sir.

Q. Have any changes been made in it? A. No, sir.

Q. It is not a multiple board? A. Yes, sir.

1639 Q. You say it is a multiple board? A. Yes, sir.

Q. What do you understand a multiple board to mean? A. I mean to say you have 14 boards, numbered from one to fourteen. If a subscriber whose number is one wants to speak to a subscriber on number fourteen he calls up the girl on number one and she, by pressing a button, can give connection to number fourteen hundred.

Q. Calls up the operator who runs number fourteen hundred? A. Yes, sir.

Q. And that operator communicates with fourteen hundred? A. Yes, sir.

Q. So that unless the calling subscriber and the called-for subscriber are in the same section the call passes through two operators? A. Yes, sir.

Q. That is your understanding of a multiple board? A. That is my understanding of a multiple board.

Q. With that switchboard is there any way in which a subscriber after he has finished one call and wants to make another can notify the office that he is through? A. Oh, yes, he rings off.

Q. Are you sufficiently acquainted with the mechanical construction on that board to tell us how he rings off and how his ringing off indicates to the operator that he is done?

1640 A. Yes, sir. He takes the crank and turns it over say twice, and that throws a drop on the switchboard, which is a signal for the girl to take out the plug.

Q. How does he notify the operator that we wants to make a call? A. Rings the bell.

Q. What does that do? A. That throws a drop that corresponds to the number of his 'phone.

Q. And is that the same drop that falls when he rings off,

or a different drop? A. No, because it has a plug in it. That drop could not fall.

Q. You have a clearing out drop? A. Yes, sir.

Q. For each subscriber? A. No, not for each subscriber because we have a hundred subscribers on a board and we have only ten clearing out drops to each board.

Q. Suppose that more than ten of your subscribers in the same section should be using their telephones at the same time. How would they manage about ringing off then? A. It very rarely occurs, but if it does, why the operator by paying strict attention to what is going on can tell.

Q. How can an operator, from only ten ringing off drops, tell that fifteen subscribers are ringing off? A. I don't know. I am not a telephone expert.

1641 Q. Don't you know that there is a good deal of complaint from your subscribers from the fact that they cannot always get two or more calls in succession, that their ringing off calls are not noticed? A. No. I know that there is complaint from some people, but that is not caused by more callers than ringing off drops. It is sometimes caused by a defect in the drop itself, which requires to be very sensitive, but that was a defect that was inherent in the old switchboard and is being remedied very fast.

Q. I understood you to say that no changes have been made in the switchboard? A. I meant that we have not changed the switchboard, but the switchboard is in much better condition now than it was six months ago.

Q. In what respect is it in better condition now than it was six months ago? A. The superintendent that we had up to the time that we employed Mr. McClure had not paid the proper attention to keeping the switchboards in order, particularly the drops. They were suffered to become very much out of repair. Consequently our complaints were a great many to what they are now. We have now gotten the board in as good condition as it was when it was new, and we have not a tenth as many complaints as we had six months ago.

Q. Has your company ever paid any dividend? A. No, sir.

Q. You have spoken of the rates charged here by the company which you call the Bell Company in Richmond,

1642 the Southern Bell Company. Do you know what kind of service they furnish for the rates you have mentioned? A. Yes, sir; they are furnishing first class service.

Q. Do you know whether they have any metallic circuit with long distance telephones attached? A. Yes, sir; they are connected with the American Telephone and Telegraph Company, which in this city is acting under the name of the Southern Bell Telephone and Telegraph Company.

Q. I believe your testimony as to the rates charged by the Southern Bell Telephone Company in this city is from information which you have received? A. Undoubtedly, as I do not take a telephone from them myself and have no other means of finding out, but I have seen their bills.

Q. Do you know, when they furnish a complete metallic circuit with a solid back or long distance telephones, whether they are furnished at the rate you have mentioned either for residence or business? A. No, I do not of course know the details of their business, but their general price charged in Richmond is thirty dollars for business 'phones and eighteen dollars for private or residence 'phones. The long distance 'phones are payable, as I understand, so much a message, I mean I charge so much a message.

Q. How many of your customers also have in their places of business or their residences the telephones of the Southern Bell Company? A. I don't know; I never counted them
1643 up.

Q. Have you ever examined their printed list of their subscribers to see how many of them are on your lists also? A. No, I never have. At one time I started to count them up, but I never finished, and then I saw many changes being made. Their 'phones are being taken out in one place and mine put in, or mine taken out and theirs put in. The lists of both companies vary from month to month.

Q. Can you readily ascertain for us how much of the interest on your bonds is in arrears? A. No, sir; I could not.

Q. Could not tell? A. I could not tell now.

Q. Would not your books show? A. No, because there are some charges and credits which we have not yet settled with the construction company.

Q. What is that difference with the construction company that makes it difficult to ascertain where you stand as to the interest on your bonds? A. There is no real difference except that the construction company have not brought in all their bills and we have not had a full square settlement.

Q. Has this company ever paid the interest on its bonds except as paid by construction in dealing with the company that put up your plant? A. Oh, yes.

1644 Q. When was the last payment on account of interest made? A. The last payment I made.

Q. Yes. A. To the construction company?

Q. To anybody on account of interest on bonds? A. Some time last month I gave them a check. That is, from month to month I give them checks as much as I can spare, and then at the end of the year we add them up and see how we stand.

Q. I have noticed that in giving your answer to the ques-

tion what was your net income, and also at other times during your examination here you have referred to a paper. Have you any objection to letting us see that paper? A. I will first defer that question to our attorney.

Mr. HEMPHILL: I have no objection.

The WITNESS: No, our own attorney.

Mr. HEMPHILL: I will offer that in evidence when the bookkeeper comes.

Mr. GUIGON: I think you had better let the bookkeeper testify about that.

The WITNESS: All right, we had better let the bookkeeper explain it. It is the annual statement.

Mr. WORTHINGTON: Inasmuch as you have given testimony from that paper I think that it is impossible for me to properly conduct your cross examination without seeing it, and if I am not allowed to see it, of course, in conducting your cross-examination I shall have to object to the whole of your
1645 testimony on that ground and ask the court to strike it out.

Mr. GUIGON: I withdraw any objection I made.

The WITNESS: I have no objection to it, by the advice of our attorney.

The witness handed the paper to Mr. Worthington, who examined it.

Mr. HEMPHILL: On one side there is a statement for one month, and on the other side is the annual statement.

Mr. WORTHINGTON: I will look it through.

Q. In this paper I find what purports to be a statement for the year 1898. I find that in it the expenses are put down at $29,021.56, divided as follows. Then the first item is shop expenses, $6,941.23. What does that mean? A. That means what we call the pay roll for the inspectors and linemen and the repairs of telephones, repairs to the switchboards, general repairs. That is the pay rolls for the repairs, pay rolls for the inspectors—

Q. And pay rolls for the switchboards? A. No, sir.

Q. The next item is "switchboard expenses, $8,829.04." A. That means the pay rolls of the girls.

Q. The pay roll of the operators? A. Yes, sir.

Q. The first item means pay roll for the linemen and other outside workers, does it? A. It means the pay roll for the linemen and inspectors. Those pay rolls are the shop
1646 pay roll and the switchboard pay roll.

Q. The next item is maintenance expenses, $2,138.93.

What is included in that? A. That is for the maintenance of the switchboard, the purchases of material for the maintenance of the switchboard, and the whole system, for the maintenance of the telephones, supplying the batteries, supplying the breakage of the batteries, supplying the breakage of the different parts of the telephones.

Q. The next item is incidentals, "which includes taxes, insurance, interest, etc., $6,045.69." What does that include besides the things that I specified, taxes, insurance, interest and rent? A. Last year it included our work here against the American Telephone & Telegraph Company and general work of conducting a canvass for telephones. Sometimes we would have to pay a man as a solicitor. We have paid $150 a month for two or three months.

Q. The last item is salaries, $5,056.67. A. Yes, sir.

Q. That includes salaries only of the general officers of the company? A. Yes, sir.

Q. Which of these items include the work of the construction gang? A. It is not there. They are charged to the construction account.

1647 Q. Do you know what that amounted to last year? A. Yes, I gave it to you.

Q. That is the item for ten months that you gave us? A. I know, but you understand the company did not do any construction up to the first of March, 1898.

Q. I understand. That item included the pay roll of the construction gang, did it? A. And the material.

Q. And the material used by the construction gang also? A. Yes, sir.

Q. For the ten months? A. Yes, sir.

Q. In those ten months what, if any, extension, did you make of your new lines and poles. A. Very few.

Q. How many? A. Oh, I can't tell.

Q. Can you approximate it? A. You mean 'phones we put in, or what?

Q. No, I mean the extension of your whole lines? A. We bought no cables. We ran no special lines, but frequently we had to put up two or three poles to reach a subscriber, sometimes five or six poles to reach a subscriber. They were short lines from our main lines.

Q. How many telephone subscribers has the Bell Telephone Company in Richmond? A. I don't know.

1648 Q. About? A. I have no idea. I cannot get at it.

Q. I understand you to say on your direct examination that they have more 'phones now than they had before you began? A. Yes, sir; because before we began their 'phones were high-priced and very few of them were in private houses.

Q. How do you know they have more now than they had then, if you don't know how many they have now? A. Because then they had not more than a thousand, and now I suppose they run up to nearly eleven or twelve hundred because they are in residences all about town. Of course I might figure it from the catalogue how many they have, but it would be hard to do it.

Q. Can you tell me what the floating debt of your company is now? A. What do you mean by floating debt?

Q. I mean any debts that are due unsecured and unpaid? A. Less than a thousand dollars. That is for material purchased within the last month.

Q. Does that include what you owe your help who have not been paid? A. Yes, sir; less than a thousand dollars.

Q. What is your cost of maintenance per telephone per year?

A. We have never separated that. We have just simply
1649 put that in with the general expense. It is hard to find out because the men that are on regular salaries do the work, and it shows there how much material we buy for the year; but it would be hard to separate the cost of maintenance from the actual expense.

Q. What kind of cells do you use in the batteries of your subscribers? A. We use these jars; I don't know what kind of cells.

Q. How long does a battery last on an average before it has to be replenished? A. I don't know. That is outside of my jurisdiction. The inspector will go around and fill them up as often as necessary, and then, besides that, I imagine it is in accordance with the use a 'phone has. A business 'phone that is used thirty or forty times a day will use up more material than one that is not used more than ten or twelve times a day.

Q. Certainly, but can you tell us the average of the maximum or the minimum? A. No; I have no means of finding out.

Q. Your books would not show? A. No, sir.

Q. You could not tell, then, what is the cost of maintaining your telephones? A. We cannot tell because we have never separated the time of the inspectors while engaged in repair work from the time that they are ordinarily engaged in inspecting telephones and putting them in order.

1650 Q. How often are the telephones of your subscribers inspected? Regularly? Is there any regular system of inspection? A. There is no regular system of inspection. Whenever a complaint is made we send an inspector to examine and inspect the telephone and see what is the matter. They perhaps fill the jar or adjust the different parts of it that may have become out of fix by constant use. Besides that, we have what we call two service inspectors, whose business is to take

every 'phone as they get to it and examine it thoroughly and put it in thorough condition.

Q. How often do they do that? A. They are engaged all the time at that.

Q. How long does it take them to get around the 1,229 telephones? A. I could not tell you that.

Q. Do you in your operating room here keep any account of the number of calls per day? A. No, sir.

Q. Have you ever had what they call a peg count? A. No, sir; but I know what it is.

Redirect examination.

By Mr. HEMPHILL:

Q. I want to ask you about these sixty-foot poles. You said they were charged at so much at the depot? A. Yes, sir.

1651 Q. Which depot do you mean? A. At the depot in the country.

Q. Well, are those sixty-foot poles confined solely to the business portion or are they used also in the residence portion? A. They are confined strictly to the business portion, except when it would be necessary for us to cross over the top of a house that would not allow us to put a frame on it.

Q. Then in the residence portion you can use less than sixty-foot poles, I understand? A. Oh, yes; we use from thirty to forty-foot poles.

Q. Is there not an ordinance on the subject relating to how low the wires can come? A. 25 feet from the ground.

Q. I thought it was 30. A. 25.

Q. 25, is it? A. Yes, sir.

Q. Do you know whether these 'phones that you use have ever been tested for long distance, or was any offer made for such a test?

Mr. WORTHINGTON: That is objected to because the witness has already stated that he has no personal knowledge on that matter, and what he has heard is not competent evidence.

Mr. HEMPHILL: I think he backed out your people in a scheme of that kind. What was that, Mr. Robertson?

1652 Mr. WORTHINGTON: I object to his testifying also as to what my people in Richmond did, inasmuch as I haven't any people in Richmond.

The question was read as follows:

"Q. What was that, Mr. Robertson? A. Well that is a long story."

Mr. HEMPHILL: State whether you offered to do that, to subject yourself to a long distance test in competition with theirs, and what was the result?

A. When the American Telephone & Telegraph Company applied for a franchise here I offered in behalf of my company to connect with them, but they refused upon the ground that our telephones were not long distance 'phones and could not talk more than seven or eight miles. I then made them a proposition that if a committee from the city council would pick out any two of my 'phones and take them to Washington or Philadelphia and connect them with the long distance wire to Chicago, if they did not talk as well as the Bell long distance 'phones, that we would withdraw all opposition to their coming into the city. They accepted our proposition. The committee from the council was appointed, came to our office, picked two telephones and took them up, sent them to the depot for shipment to Philadelphia with the committee that was going at the time, but at the last moment the American Telephone and Telegraph Company backed out, and they declined to make the test. We sent one of our 'phones, however, to Philadelphia by a friend of ours, who connected the 'phone with the long distance wire to a point twenty miles beyond Chicago, and had a
1653 very satisfactory conversation. That I will not testify about, however, as I did not make the test myself.

Q. The latter part of it, you mean, you did not do. The other part you were cognizant of? A. Yes, sir.

Q. Now, this company, as I understand, had no regularly paid in capital from the start? A. No, sir.

Q. And the bonds were issued for the construction of the plant? A. Yes, sir.

Q. Well, you have paid this construction party money from time to time, as I understand you? A. Yes, sir; all the way along, every two or three months, we give him a check.

Q. In addition to the bonds? A. On account of his interest.

Q. Have you paid him some other things beside interest or not? A. Yes, sir; we owed him beside interest.

Q. About how much? A. Well, very nearly $8,000, as much as two years' interest on the bonds at the time, which we have paid.

Q. You have paid that? A. We have paid that.

Q. Then the interest you have paid all but $5,000?

Mr. WORTHINGTON: I wish you would not ask leading questions.

1654 By Mr. HEMPHILL:

Q. How much? A. We have paid him money from time to time, sometimes $100, sometimes $400, sometimes $500; just as we could spare it.

Q. State whether your accounts between him and yourself have been fully adjusted or not? A. No, sir.

Q. Are there any items in controversy between yourselves? A. None; not one.

Q. You don't understand my question? A. Yes, I do.

Q. I want to know whether there are any items— A. There is no controversy between us.

Q. I misunderstood your direct examination.

Mr. WORTHINGTON: No; you mean the cross-examination.

Mr. HEMPHILL: I thought he said in his direct examination that there were some bonds about which they had not agreed.

A. No; but the fact is, we have not had a full and general settlement of all accounts between us. We owe him some money and he owes us some coupons. Don't you see?

Q. Oh, yes. From what source were salaries and expenses paid from the time the company began operations up to the time you began to charge your subscribers? A. They were paid from the earning of the company, in this way, that a few business men paid for their 'phones at the time, but it was generally understood that they were not; I mean that the general public were not to pay for their 'phones until we had a
1655 thousand; but I collected enough money from the subscribers to pay all expenses. You must understand that that the expenses were very small at that time. We had no maintenance account of any consequence.

Q. Such salaries as those of the president, attorney and so forth, had they been paid? A. Yes, sir.

Q. From what source were they paid? A. All from the earnings of the company.

Q. You stated a while ago something to the effect that there had been no separating of accounts between maintenance and expenses. What do you mean by expenses? A. Oh, no.

Mr. WORTHINGTON: He said there had been no separation between maintenance and construction.

By Mr. HEMPHILL:

Q. What did you mean? A. I mean that there is no separation of the maintenance account between the labor and the material furnished in the maintenance.

Q. Which one of those do you call expense? A. You misunderstand me. I mean we have never separated the labor account and the material account in the maintenance, so as to show what part of maintenance went for labor and what part of the maintenance went for material.

Q. You have stated, I believe, what the average cost of running these telephones or the maintenance of each telephone was during the year? A. Yes, sir; $23.61. That includes
1656 the expense of operating and keeping the telephones and the switchboard in good condition.

Q. And salaries of officers? A. And salaries of officers.

Q. Is that wire of good quality or bad quality, the wire that you have shown here? A. We buy the best to be had of that kind. Of course copper wire would cost us a great deal more, but I do not think any company uses a copper wire except in cables.

Recross-examination.

By Mr. WORTHINGTON:

Q. Has the stock of this company any market value here in Richmond? Is it quoted at all? A. Two-thirds or more of our stock is pooled and none of it is on the market, nor has it been offered on the market. This, of course, carries the control of the company. The other stock of the company is held outside, and some of it has been sold in small blocks, though one-half of the outstanding stock is held in a block, and has never been offered for sale to my knowledge—one-half of that which is not pooled.

Q. My question relates to the market value, whether it has any established market value? A. It has no established market value.

Q. Now, as to the bonds; have they any established market value? A. They have never been offered. No bonds have been offered except a small amount sold in Chicago at par.

Q. Who was your friend who took one of your tele-
1657 phones to Philadelphia to make the test? A. I don't recollect his name, as it was not done by me. It was not worked by me. A friend of ours worked it and reported it.

Q. And you cannot even tell me who it was? A. I don't know. I never knew who it was.

Q. You did not get your information directly from him, then? A. No, sir; that is altogether hearsay on my part.

Q. That seems to be double hearsay? A. Altogether.

Redirect examination.

By Mr. HEMPHILL:

Q. Mr. Robertson, in the 1,200 'phones that were constructed and paid for by the bonds of the company at $75 per 'phone, state whether that included the 'phones that have been since that time taken out because people declined to pay. A. Oh, yes. Some of them have been taken out, but I never kept an account of those that had been paid for by bonds as distinguished from those that had been put in since by me; but most of them were those that were put in by the Construction Company, as we have used more care since we have been doing our own construction.

Q. And when you have a settlement with the construction man, how many did you pay him for? A. 1,200.

JOHN T. ROBERTSON,
By the Examiner, by consent.

Subscribed and sworn to before me, this —— day of ——, A. D., 1899.

————— —————,
Special Examiner.

1658 Thereupon the further taking of testimony was adjourned until 3 o'clock p. m., at the same place.

Three o'clock p. m.

ADDISON MAUPIN, a witness of lawful age, produced on behalf of the complainants, after being first duly sworn, deposes and says as follows:

Direct examination.

By Mr. HEMPHILL:

Q. Please state your name, age and residence. A. Addison Maupin, age 44; residence, Richmond.

Q. State what connection you have with this company. A. I am not exactly their bookkeeper, and yet I superintend their office work.

Q. Supervising bookkeeper, I suppose. A. You may call it that.

Mr. ROBERTSON: You might call it expert bookkeeper.

A. No; I don't care to call it by that name. The young man who is in there not having graduated in bookkeeping nor having had very much experience, he does the main work under my direction. I come here every afternoon and look over it.

By Mr. HEMPHILL:

Q. (Showing witness a paper.) Examine that paper and see what it is. A. This is a statement of the business of 1898.

Q. Was that made up from the books or not? A. It was; yes, sir.

Q. In whose hand-writing is that? A. Mine.

1659 Q. State whether it correctly represents the business of the company at that time or not? A. Well, it does, with the possible exception of the number of 'phones in service, the average number of 'phones in service throughout the year.

Q. State what, about that, as to whether that is nearly correct, or what about it? A. Under the system that I found in vogue when I came here it was almost impossible to tell just

how many 'phones they had in service on any given day, without very great labor. It would take quite a number of hours to ascertain that, for the reason that when this company started a great many people agreed to take their 'phones and to begin to pay for them when a certain number were in service, you understand. 'Phones were just put in anywhere, as I understood at the time. If anybody said he wanted a 'phone, it was put in, and after they got up to this maximum number agreed upon they began to send out bills, and people said, "You have not got that number yet; your catalogue does not show it," or something of that sort. Consequently the company soon began to take out 'phones, and it was just a constant taking out and putting in, sometimes four or five or seven or ten would come out in a day, and as many more would go in. I was not in the office at that time, and the young man in the office, not the same one who is there now, not being familiar with it, did not keep a very accurate record, as a matter of fact, of the number of 'phones put in and taken out, and I could not tell anything except what I found charged on the list. Well, a man would be charged with a 'phone to-day and possibly another
1660 credited by another taken out to-morrow, and so it would go, and I never was able to ascertain just exactly how many 'phones were in service, except by the catalogue. Now, a good many of those 'phones that were catalogued were not revenue yielding at all. They were people who still had the 'phones, but claimed that the company had not done all they promised, and consequently they would not pay anything. I did not feel authorized to count those 'phones as 'phones that yielded revenue, and so I said to the company last fall—they asked me, "How many 'phones have we in service?"—I said, "I cannot answer that question satisfactorily to myself or to you, unless you will let me have a new set of books made for this business, and let me take hold of the catalogue and ascertain from you just the number of people in your catalogue who are paying subscribers, and if you give any 'phones to anybody charge them up, charge them all to expense, for it would be an item of expense if they gave them away as an advertisement or anything else, and then—

Q. Well, I don't know as it is necessary to go into all that. The only point is whether that is the best average that you can get. A. Well, I can answer that that is the very best average I could make. It represented—

Q. Do you think it is correct or not?

Mr. WORTHINGTON: I object to the question for the reason that the wifness has already stated that it was impossible to make a correct statement, and he was interrupted in the midst of his answer, which would have enabled us to know to what extent that incorrectness would affect this statement.

Mr. HEMPHILL: Go ahead with your answer, then.

1661 A. I started to say when I was interrupted that this was the actual number of 'phones in use on the 1st day of January I went back—

Mr. WORTHNGTON: 1,229?

1. 1,229. I went back over the books, counted up as best I could those that I thought yielded revenue, and I made an average and it approximated that. It might have been 1,225 or something. I don't remember the exact amount, because I saw I was so near it that I said, "Well, unless I work over this thing several days longer I probably will not get any nearer to it, and so far as the company is concerned this is all they need. We are starting fresh from the 1st of January, and here is the basis on which we begin, 1,229 'phones actually in service."

Q. Well, state whether the other items are correct, or whether they are estimates? A. These other ones are absolutely correct, sir, from the books, every one of them.

Mr. HEMPHILL: I want to offer a copy of that statement in evidence. You cannot take the original.

Mr. WORTHINGTON: Why not?

The WITNESS: I have made three that I call originals, sir. I have three which I duplicated, one of the other. Mr. Robertson has one, this one, and Mr. Moore has one. Either one of them is an original.

Mr. HEMPHILL: If there is no objecttion I will put that statement in.

Mr. WORTHINGTON: I have no objection to the statement, provided we have an opportunity to cross-examine, and,

1662 if necessary, to see the entries from which it is made up.

By Mr. HEMPHILL:

Q. Have you there a statement for January of this present year? A. Yes, sir; on this same sheet.

Q. State whether that is an estimate or whether it is correct? A. It is correct, sir; absolutely so.

Mr. HEMPHILL: I want to offer that in evidence also.

The statements referred to are marked Exhibits Maupin 1 and Maupin 2.

Cross-examination.

By Mr. WORTHINGTON:

Q. I see by this statement, Maupin 1, that there is one telephone for which the rate is $56 instead of $36 or $24, which seems to be the rate charged for most telephones. What is the reason for this distinction? A. Because the $24 sets are just

plain wall sets for residences, and the $36 sets are plain wall sets for business, and if a man has his wall set yonder and his desk in another room, and he wants an extension bell or something of that kind, there is a different charge. Sometimes he has two, and then there are reasons of that sort.

Q. Do you know what is the case in this particular instance? A. I do not, sir, because I don't know whose that particular 'phone is. It is one of the many. I took them and they are charged on the books. Then when they are beyond the
1663 corporate limits, I think possibly there is some difference in the charge.

Q. If you go beyond the corporate limits you increase the rate for the distance? A. There may be something of that sort, I don't know. Mr. Robertson would have to answer that, because the only thing I do is to deal with the figures as they are presented to me. It is not my business to ask questions as to the whys and wherefores of these things.

Q. I find also that there are two telephones for which the rate is $42, one $40, five $50 each, two at $45 each, and five at $54 each, one at $60, eleven at $48, three at $72. Can you tell me as to any of these, how it is that they are charged more than the regular rate? A. It is simply because they have more than the other people get. They have either extension auxiliary bells, you know, and desk sets—

Q. Or else they are at a greater distance? A. I don't know about that, sir.

Q. Don't know how it is? A. I cannot answer that.

Q. The fact is, all the information you have on this subject is hearsay. You don't know of your own knowledge as to any of this. A. I don't know a thing in this world except what I am told to charge these 'phones up. If you want to find that out, I dare say Mr. McClure, the manager of the company, can give you a reason for all these things.

Q. Is Mr. McClure here in Richmond now? A. I
1664 judge so, sir; I don't know anything about that.

Q. What is your regular business now, Mr. Maupin? Where do you work regularly? A. I am in the tobacco business, Loris & Brothers.

Q. What is the nature of your connection with that business? A. I keep the books there.

Q. Is that a large concern? A. Yes, sir; fairly large. It employs about 150 hands, manufactures tobacco.

Q. Are you the principal bookkeeper there? A. Yes, sir; the only one.

Q. And the only one? A. Yes, sir. I not only keep those, but the Hamburg and Bremen Fire Insurance Company, of this city. I have kept their books for nine years. I keep the books of this concern, and I have two other concerns. I have five con-

cerns. I am quite a bookkeeper. There is only one of them that takes all my time in the day, Loris & Brothers. That is my regular employment. I am there in the tobacco business, and I have an interest in that business.

Q. How often do you come regularly up to the office of this company? A. Every afternoon.

Q. How much time do you spend here? A. I spend just as much as is necessary. Sometimes I come here at six and leave at eleven at night. Sometimes I get here at six and leave at seven.

Q. What is the name of the young man who is now
1665 regularly in the bookkeeper's office here? A. The cashier, you mean, I suppose.

Q. Yes. A. Mr. Arthur Cherry.

Q. He is the young man you have spoken of who makes the entries? A. No, sir; he is not the young man I spoke of who did the work in 1898, because he was not here then.

Q. Who was that? A. Well, there were two during the year 1898. The first part of the year was Mr. Baker, and I think this young man who is here now was here probably the two or three latter months of the year.

Q. Of 1898? A. Yes, sir.

Q. When did you begin to help here? A. In February, 1896. The way my connection happened here—

Q. The question is just when, not how it happened. When did you come? A. I will have to explain that to you.

Q. Well— A. When the company first organized they had some young lady to make a record of those 'phones, subscriptions and so forth, charging them up. After they had been here at work, probably from October or November until the following January or February, they found that it would require a regular set of books. So Mr. Moore, knowing that I had some knowledge of this work, asked me to come up and see if I could open up a regular set of stock company books for them, and I came up and—

1666 Q. When was that? A. You will have to let me look over the ledger to find out.

Q. All right; look at it. A. I would like to be exact.

Q. Bring it in. We want to look at it presently. A. In February, 1897, when I first came. Some work I did extends back into 1896, I find.

Q. Since then have you made the entries in the books yourself. A. Yes, sir; in the journal and in the cash book; they are all in my handwriting.

Q. The posting into the ledger is done by the cashier? A. No, sir; to the general ledger by myself; to the subscriber's ledger by the cashier. We have two ledgers, one on which the accounts with the subscribers are kept. I enter the original

amounts in the cash book, but he does the posting, and then I take it afterwards and see whether it is correct or not.

Q. In entering the expenses of the company, whether for operating, maintenance or construction, where do you get your data, or how are you instructed as to what entries to make and upon what accounts to make them? A. When a bill is paid the stub of the check book is marked, whether it is to maintenance or whether it is for construction, or whether it is plain expense; in other words, to correspond with the heading of the account on my ledger.

Q. And you get the bills and are governed by the memoranda in the check stubs as to the account to which they are
1667 to go? A. I sometimes take those bills, if any doubt whatever occurred to my mind, I have taken the bills and compared them with the stub of the check to see if mistake could have been made, and have made inquiries sometimes. For instance, I have been here at night, and often I was not certain about a thing, though it would be entered up that way. I would be afraid the young man had made a mistake, and I would make a memorandum of it and ask the next day before I entered it up, leave it off and enter it the next day.

Q. Will you look at this statement, Exhibit Maupin 1, and tell me in what item or items of it are included the amounts expended by the company during the time covered by the statement, for construction? A. No, sir; because it is not on this statement. It is on the financial statement, which I rendered, and if I were to bring the balance sheet for the month of December, which shows up to the first of January, you will find there that the item of construction was on the balance sheet and it was unnecessary to put it here, because accompanying this paper was the balance sheet and also the financial statement. This is simply a statement of the expenses, as compared with the number of 'phones in service.

Q. It takes the balance sheet and what other paper? A. The financial statement would show that.

Q. It would take the balance sheet and the financial statement and this paper to make a complete exposition of the financial transactions of the company, would it? A. It
1668 would certainly take the financial statement and this paper.

Q. I would like to look at the financial statement. A. Mr. Guigon would have to produce that. It was given to him at the time.

Mr. GUIGON: It was not given to me.

The WITNESS: Mr. Robertson will know.

The witness leaves the room, and upon his return says: I could not find it, and neither could I find Mr. Cherry. He must

have had a call on the street. He can probably produce it later. Mr. Robertson said Mr. Cherry put it away. If you just want an answer about the construction question I can go over to my ledger and tell you immediately what the amount was.

Q. I wish you would bring the ledger here and get at those items, if you cannot do any better than that.

The witness here produces the ledger referred to, being ledger No. 1, Richmond Telephone Company, and turns to page 99, where there is an account headed "Construction," the first entry in which is dated October 18, 1897.

A. Here is a credit of $352.50, which ought not to have been charged to construction. I just want to explain it to you personally.

Q. It does not do any good to explain it to me. It will have to go on the record in order to be of any service to us. A. The sum of $5,769.30 was spent from the 1st of October, 1897, to January, 1899, in construction of new lines by the company outside of the original contract with Mr. Moore.

Q. How much of the expenses for January, 1899, have
1669 been on account of construction? A. $724.63.

Q. And how much during the month of February? A. $444.24, because on account of the blizzard there was very little new work done in that month. After that the work that was done was repairing lines, and that was charged to the expense account.

Q. Now I find, taking the large items for illustration, that in this account, under date of December 31, 1897, there is an entry, "Warner Moore, $651.18," charged to construction. What does that mean? A. That was something that was charged to construction account that he had furnished, but that had been put up by this company independent of the contract that he had with them.

Q. Isn't there something here which will show just what that was? A. I judge there is a voucher for it.

Q. I would like to see the voucher. A. I cannot produce it. I don't know exactly where it is. It is in the papers somewhere, but I was not keeping the books at that time.

Mr. WORTHINGTON: Can you produce it, Mr. Robertson?

Mr. ROBERTSON: What is that?

Mr. WORTHINGTON: Here is an item of December 31, charged to construction, W. Moore, $651.18, charged to construction. I want to see the voucher for that, to see what that is.

The WITNESS (Mr. Maupin): Let me see if my journal explains that entry.

The witness here produces the journal referred to.

A. The journal states, "Construction account, Debtor to War-

ner Moore, as per voucher, $519.83; a charge of February
1670 25, 1897, $33.66; a charge of November 18, 1897, $97.19,
and fifty cents brought over, because that was fifty cents left off of one of the other items, making a total of $651.18. Now, in explanation of these two amounts, the charge of February 25 and of November 18, they were amounts incorrectly charged to Warner Moore at the time of the original entry from the cash book, when they should have been charged to construction account. Therefore they are now charged to construction account, and Warner Moore is credited, and this item "Per voucher," I can explain to you why those vouchers cannot be produced.

Q. You mean the vouchers representing the item of $519.83? A. Yes, sir; I can explain why they cannot be produced. Mr. Moore would bring up a great long account that he had, articles that he had ordered, and he would have marked on it, "Charged to Richmond Telephone Company;" in other words, that they had used the articles, or certain of them, and when we would do that we would have an account that we had furnished him of charges against him. So he would add up what we owed him, and we would strike the difference and credit him or charge him, as the case might be. Then he would take his papers back and we would file ours, and there were no other vouchers than those.

Q. Is there anything here, however, to show how that $519.83 is made up, and for what the money was expended, whether for poles or wires or on account of switchboards or anything else?

A. I should suppose that there is something among the
1671 files, either Mr. Moore's papers or this company's papers, but I could not produce it for the reason that I am not here all day long. I only come here at night.

Q. Let us try another item. Referring again to pages 90 and 91 of the ledger, let us go to the other end of the account and take the last item, February 28, $444.24, charged to construction. How is that made up? A. That is made up by the payment of pay rolls to hands building the line.

Q. The construction gang? A. The construction gang; yes, sir.

Q. Those that you are paying on here in February of this year; is there anything to show what work that construction gang was doing at the time? A. They were putting in new telephones.

Q. Do you know of your own knowledge? A. I only know what is reported from the manager's office.

Q. Is that reported in writing? A. Certainly; he makes up the pay roll in writing.

Q. Is there something in writing that will show how that

item of $444.24 is made up? A. Yes, sir: my cash book will show that that item is possibly made up of pay rolls. I don't know.

Q. I should like to see just how it is made up. A. Well, I will find it in the cash book. I can answer that question by the cash book. Turning to page 12 of the cash book, under the head of construction, February 2, the first item is freight on poles, $119.49. The next item is hanging wires to C.
1672 Wheit, $20. That is Charles Wheit, the name of a man.

Q. What is the next? A. American Hardware Company for glass, $2.05. The next is a pay roll, $299.50. The next is C. W. Vaughn, locks and so forth for those boxes, $1.50. The next is Wheat again, $1.50, work on line, $1.50.

Q. Those items aggregate $444.24? A. Yes, sir.

Q. Now, is there anything to tell us where those poles were to be placed? A. Yes, sir.

Q. That cost $119.49? A. No; I don't know where they are to be placed. I know there were poles ordered.

Mr. ROBERTSON: They are in the yard now.

The WITNESS: The poles are here somewhere; I don't know where.

Q. Are they to be kept to be used when a pole gives out, to replace it? A. No, sir; that would be maintenance. You see, when a man orders a 'phone and you have got to run a line to his house, that is construction, as distinguished from maintenance. If a pole gives out and we replace it, that is charged to maintenance.

Q. These poles on which you paid this freight of $119.49, are they to be kept for construction, or do you have one pile for construction and another pile for maintenance? A. If we get them out of the same pile it is reported at the time whether they are used for maintenance or construction and
1673 charged to the proper account.

Q. But this seems to have been charged to construction at the time the poles arrived? A. Yes, sir; and if any are used for maintenance, the construction account will be credited with maintenance, and maintenance charged.

Q. Can you give me an illustration from anywhere in your books where that has been done? A. Yes, sir; I can refer to that statement, Maupin 2, receipts from sale of poles, credit to construction account, $10.80.

Q. That was in the month of January, 1899? A. Yes, sir.

Q. To whom were the poles sold? A. What is that fellow's name? I will find it if the young man has not gone to his dinner.

Q. To whom were those poles sold? A. I can find the gentleman's name as soon as the young man, who has gone to dinner,

comes back. He told me at the time, but I did not think it necessary to put it on the books.

Q. What did he want of the poles? Do you know? A. No, sir; that was none of my business, sir.

Q. He had nothing to do with the company? A. Not that I know of. He bought some poles. What he wanted with them I don't know.

Q. Then the illustration you have given us is where the company sold the poles outright to somebody else? A. That is what I think it was.

1674 Q. I understood you to say that when a lot of poles had been bought and charged to construction, that when you used any of them for maintenance, you credited construction and charged maintenance? A. Unquestionably.

Q. Now, I would like to see an illustration of that in your books. A. I don't know that we have used any for maintenance, but the very fact that we have used some for some other purpose, and that they were placed to the credit of construction account, that construction account might show the exact amount which should be charged to it, no more and no less, is very good evidence that if they were used for maintenance a similar entry would be made.

Q. That is very good reasoning, but I would like to find an illustration in your books where that has been done. A. Possibly by this time next year you may find it.

Q. Do you mean to say they have not had any occasion in the last year to use a new pole in maintenance? A. I don't mean to say that they have not had occasion to use new poles in maintenance. Doubtless they have had several occasions, but possibly the poles were charged to maintenance at the time.

Q. Can you find anything in your books, any entry in your books, of poles charged to maintenance? A. I will look and see, sir; I don't know. I don't know whether I can. I find such items as sundries, $96.86.

Q. Do you know what the sundries are? A. I could ascertain if it is necessary, I suppose.

1675 Q. I should like you to find any poles charged to maintenance, either on the books or by reference to the vouchers upon which the entries are based. A. Well, I will have to get another cash book.

Q. What period is covered by the cash book you have been looking through? A. The 1st of January, 1899, to this date. It is very hard for me to charge my memory with these things, not having had the slightest idea I would ever be called upon to answer such a question.

Q. I understand that. I am not asking you to trust to your memory. I want to see what the books show. A. We will see in one moment. I have gone back to the middle of last year,

and I do not find any such entry, and I take it for granted that there was none, because it is comparatively a new line, and there would probably be no necessity for replacing the poles.

Q. Will you look at your book for the months of January and February, 1899, and tell me what amounts you have charged to maintenance? A. Yes, sir; January and February, 1899. Maintenance for the month of January, $99.42, for actual money paid out. There was more, but that had not all been paid. In the month of February, $326.56.

Q. Now, take first the entry for January, $99.42. How is that made up? A. Understand we charged in the maintenance of our 'phones the running cost of the switchboard, the operating expenses; power and light, to the Electric Railway Company, $24.24; G. and A. Bargamin, lead pipe and so forth, $1.80;
Purcell, Ladd & Company, repairs to the roof where we
1676 run our wires on these horses, $2.50; Powers-Taylor
Drug Company, 1 barrel of blue stone, $18.06.

Q. What do you do with blue stone? A. I don't know, sir. I am not an expert on the telephone business.

Q. That goes into the batteries, doesn't it? A. I suppose so; I don't know anything about that. We charge everything of that kind for running expenses. Cords, $1.50; care fare for inspectors, $2. They are the men that go around inspecting the different 'phones; rent for sub-station, $12.

Q. Please take the items for February, 1899, for maintenance, and let us see how they are made up. A. Car fare for inspectors, $3; repairs to broken line, $1.50; Western Telephone Construction Company, sundries, $96.80. That is a bill for different items used in the maintenance of the plant. I really could not read them. If you want to know what they were, I did not itemize; if the company wants to know, they can refer back to the bill. I would not know what they were to save my life. The names are contracted, you know. Gloves for one of the inspectors, $1; care fare for inspectors, $2.50; meals for extra men doing repairs, $1.15; car fare of inspectors, $2.50; helpers to linemen, $22.75; two joints and soldering sleeve, $4. I don't know anything about what joints are. I take these as reported to me. Express on wire, $11.71; soap for operators, $.25; car fare of inspectors, $2.50; oil for sub-station, $1.30; W. H. Moore, trustles for Purcell, Ladd & Company, $16.00; car fare for inspectors, $2.50; cost of cleaning sub-stations, $3; car fare for inspectors, $2.50; extra linemen and helpers, $42.50; re-
1677 pairing broken lines, from the pay roll for that purpose,
$109.10, making $326.56.

Q. When a telephone equipment is installed in a new subscriber's house or office, do you know whether any charge is made to maintenance, or whether it is all charged to construction? A. Do I know?

Q. Yes. A. I could not answer that question; I will tell you why. They report to me that a man has been given a 'phone, and I charge him with the 'phone. I charge up these bills that I rendered afterwards, and I could not tell you to save my life when I charged them, whether they are for putting in a new 'phone or whether it is for repairing the line. I do not answer those questions. I could not undertake to charge my mind with the details of the business in that way, coming here, as I do, only in the evening, you know.

Q. When a subscriber gives up his telephone, his instrument and the house wires and the wire connecting him with the main line is taken down, do you know whether any charge is made or entry in the book in regard to that? A. It is done by one of the young men who figures on what is called the shop pay roll, which becomes a part of the items of expense for the business.

Q. That is, the pay of the men who do that? A. Yes, sir.

Q. What is done about the loss to the company from the wires that are taken down? A. It is a clear loss, so that
1678 there is no entry made of it.

Q. No entry made whatever? A. No; certainly not. They are of no value to the company unless they use them again. There is no entry made of those things that I know anything about, unless the company gets the credit for it in this way, that if they take the wire down and use it anywhere else in their construction or in their repairs and maintenance, it would go on something that might get the benefit of it, by having a smaller construction or smaller maintenance account. There is no entry on the books made of it.

Q. Are there not some cases in which you put up telephones for subscribers where several poles are required to reach a subscriber? A. Oh, certainly, sir.

Q. That is charged to construction, of course? A. If it is a new 'phone.

Q. If it is a new 'phone? A. If it is a new 'phone that would naturally go to construction.

Q. Suppose he gives up that 'phone and that line is of no further use. Are entries made of that? A. None in the world. Those poles remain for the present, and when another man takes a 'phone and those same poles are used no entry is made charging them to the construction account, because they have already been charged once, you understand. The poles remain and no entry is made in construction, and neither is there any entry made charging to construction on the second set of
1679 'phones, because the entry has been made once.'

Q. Who does that work? A. The construction gang.

Q. To what account are the pay rolls of the construction gang charged? A. To construction account.

Q. Now let me see this ledger account again, please. A. If you want to know what my opinion is, as a mere matter of opinion, I will tell you what I think. I believe that the construction account ought to be about fifty per cent larger than it is. We have charged to maintenance a good deal of money that ought to have gone to construction, and I have been kicking here all the year, telling them I thought so.

Mr. WORTHINGTON: I object to that statement of the witness, first because it is volunteered and not in response to any question of mine, and, second, because it is not shown that he is qualified as an expert to render an opinion on the question.

The WITNESS: I wish you would let me go back to my business then.

Q. We did not bring you here. Please look at this item in the construction account under date of December 5th, 1898. It is a charge of $341.75. Tell me what that means. A. December 5, pay rolls, $341.75.

Q. That is this same construction gang you spoke of. Is there any way of showing what work they were engaged upon during the week covered by that payment? A. I don't know. I have the pay roll there.

1680 Q. Is that the pay roll for the week? A. No, that is probably the pay roll for two weeks, half a month, as it usually is.

Q. Yes, that appears already, that they are paid every two weeks. A. Yes, sir; I think so. I am not quite sure of it.

Q. Well, let us take another item. Running backward the next item in this account exceeding $100 is one dated November 14, 1898, $352.46. Was that a pay roll too? A. No, sir; that is for material, Roebling and Son, $352.46.

Q. Is there anything here to show what material that was? A. Their bills are on file.

Q. Does the cash book show? A. The cash book only shows that it was paid to them.

Q. I wish you would let us see the bill, then. A. You will have to wait until the young man comes. He has all those things locked in the safe. He has charge of the office during the day.

Q. When will he be back? A. I don't know, sir, but he has gone to his dinner, I think, and he lives about four miles over on the other side of town.

Q. The next item exceeding $100 is one of October 4, 1898, $266. Can you tell us what that covers? A. A pay roll, sir.

Q. Of the construction gang? A. Yes, sir.

1681 Q. You have no means of knowing what work the construction was doing then? A. I don't know anything about that, sir.

Q. The next of these large items is dated September 7, 1898, $300. What was that? A. Pay roll for part of August, $300.

Q. To the construction gang? A. Yes, sir. Pay roll from August 1st to September 1st, $300.

Q. The next large item is August 9, 1898, $253.91. It appears from this ledger that that was for payroll, and I presume it was the pay roll of the construction gang. A. Yes, sir; construction pay roll, $253.91.

Q. The next large item is July 13, 1898, $284.26. That was a pay roll also I see from the book. A. I was not here at the time and that is not my handwriting. Temporarily Mr. Baker had charge of that. What is the date of that?

Q. July 13, 1898. A. Pay roll, $284.26.

Q. The next is June 30, pay roll $260.83. A. That is right, sir.

Q. That is the pay roll of the construction gang again? A. It is so stated here, construction pay roll.

Q. Then on June 30, under head of sundries, here is an item of $354.26. What is that about? A. You will also find on June 30, construction, petty cash, I reckon, $19.31.

Q. Yes, but I am only taking the larger items.

1682 A. Construction to sundries, the Standard U. G. Company, which means Standard Underground Company, bill of March 9, 1898, $175.59; Roebling and Son, May 27, 1898, $66.95; Roebling and Son, June 7, $11.46; Potter Carter and Wilkins, $76.76; Whitman and Couch, $23.50; making $354.26.

Q. That was for various materials purchased from different sources during the month? A. Yes, sir, not during the month, but prior to that time, credited up in the month of June.

Q. Have you anything to show what those materials are and for what purpose they are used? A. I presume the bills will show what they were and we cannot—

Q. And we cannot get the bills until the young man gets back? A. No, I guess you are in the same fix.

Q. The next of these items is June 1, 1898, Warner Moore, $334.36. What does that mean? A. That is one of those transactions that I explained awhile ago.

Q. The next is February 28, 1898, Warner Moore, $268.07. That is another of those transactions, is it? A. In the settlement between us, the balance being in his favor, it was charged to construction.

Q. The next day is May 6, cash $265.90. What does that mean? A. I will have to find it from the cash book. It is a pay roll, sir.

Q. That was the pay roll of the construction gang,

1683 was it? A. Yes, sir.

Q. Then on April 7th is an item of cash $150. A. Construction pay roll, $150.

Q. March 31, sundries, $219.05. A. Construction to sundries. That is sundry materials, all from different parties, Whitman and Couch, William Brookfield, John A. Roebling, Sons and Company, and Alfred Moore, aggregating $219.05.

Q. The only other items in this construction account, of over $100, is one of December 7, 1897, for $304. A. That is for telephones.

Q. Anything here to show where those telephones went? A. The charges on our books show that they went to different subscribers' places of business. They would not be paying for us, I reckon, if we did not put them there.

Q. You do not know anything about those? A. No, sir; but I see them all around town and we charge up those 'phones, and they are used, and of course we are constantly constructing, putting up new 'phones, and those that we buy are used for that purpose.

Q. Where does this company keep the telephones and other telephonic apparatus which it has on hand from time to time? A. You will have to ascertain that from the President, sir. I am the bookkeeper and I don't know anything about that.

Q. Can you find me any entries in your books in which any part of the pay roll of the construction gang has been
1684 charged to maintenance? A. It would not be done in my books, sir. The separation would be made, the amount that ought to be charged to maintenance or to any other than construction account would be taken out by the manager before the pay roll was made up for construction. For instance, if a man at work on repairs for maintenance, it would go probably into what they call the shop pay roll. Did you notice that I had such an account?

Mr. WORTHINGTON: Yes, I noticed that.

The WITNESS (continuing): The shop pay roll, and things of that sort, and it does not go directly to maintenance, but at the end of the year it goes into the general expense account, you know, and he would probably separate them at that time. I heard him talking about that, something to that effect, when some such question arose in the office, and I suppose that is the way it is done, but not being here and not having charge of that part of it, I don't know any more than that. It is merely a supposition.

Q. Then suppose we take the shop account. I see in this statement, Maupin 1, you have put the shop expenses for 1898 as $6,941.23. Where do you get that information? A. Get it from the pay rolls, sir, as they are paid every two weeks,

or sometimes monthly, if we happen to be short of funds, they are paid monthly. That simply represents cash paid out to hands, and we call it the shop pay roll. Now, they may be working in that shop yonder, or they work out on the streets, as far as I know directly. I don't state that as a fact, that they are at work on the streets, because I don't know it, but I simply say so far as I know.

1685 Q. Where are those pay rolls now? A. They are kept in the safe in the office.

Q. I would like to see the pay rolls for the last two months, January and February, 1899, both of the shop account, and of the construction account. A. Well, I will state to you that I do not make up those pay rolls, have nothing to do with them, and that I never see one of them. I get the figures from the stubs of the check book, as I explained to you a while ago, as the money is drawn, and where they are I don't know just at this moment. You will have to wait until the young man I have been telling you about all along comes back. Any of those things you choose to ask for, he will find out. The young man is here now.

Q. Now I want the shop and the construction gang pay rolls for January and February, 1899.

The witness asks the cashier to produce the pay rolls in question.

Q. Do you keep in the office any daily record of the work done by the different gangs of men? A. I do not, sir. That is the General Manager's duty. He keeps all that.

Q. That is Colonel McClure? A. Yes, sir; Colonel McClure, I should think, does that. I does not come under my supervision at all, but as I have explained, I only deal with figures that are given to me.

Mr. WORTHINGTON: I wish it to appear on the record that the witness here produces two pay rolls covering the period from February 1 to March 1, 1899, one of them marked

1686 construction and the other shop.

A. The one marked shop is from February 1st to February 16th, 1899.

Q. Oh, yes. How many men ordinarily comprise the construction gang? A. I know nothing about it, sir. I do not make out these pay rolls and only know that the things I have to deal with are the things I find on the check book.

Q. Was the construction gang increased in number on account of the damage done by the storm of February 13? A. I don't imagine it was. I suppose the maintenance gang was. In fact, I should imagine that the construction gang did not do very much work after the storm. I don't know about that.

Q. Is this pay roll marked shop the one that you refer to as the maintenance gang? A. I have stated a while ago that it was possible, but I did not know it to be a fact, that
1687 some of those men were employed on the maintenance work.

Q. Some of what men? A. That some of the men on the pay roll marked shop pay roll might have been employed on maintenance work, but I do not know it to be a fact.

Q. I find that on this shop list the designation of occupation of the men upon it is given as superintendent, switchboard man, three inspectors, two linemen, one repair man, one instrument setter, one assistant instrument setter, office boy, stenographer, collector, cashier and janitor. A. I would state in answer to your former question that those men who were there as linemen undoubtedly did repair work, out on the field. They are on the shop pay roll, and therefore it follows that a great deal of the shop expense, chaged up to shop pay roll is for maintenance, and accounts for the small maintenance expense that I have on my books. It goes in under another head.

Q. It is properly charged as one of the expenses— A. Of shop pay roll.

Q. It is not charged to construction, however? A. No, sir; it does not go to the construction at all, it goes to the shop pay roll.

Q. Now when I take up the other pay roll which you have produced, the one marked Construction, I find the men upon it enumerated as follows: One foreman, five linemen, three groundsmen, one timber man and one cableman. Do
1688 you know what those men were doing during the month of February? A. I imagine, sir, that that pay roll is to cover the 'phones that were put in in the first part, the first half of the month of February, prior to the blizzard, as you will see from this statement which is in evidence (referring to the paper containing exhibits Maupin 1 and Maupin 2). No, it is not on there, but as a matter of fact there were a number of new 'phones put in the first part of February.

Q. Well, I see that the foreman on this construction pay roll was paid $50, his full pay for the month. Do you think he was only working half the month? A. Well, you must ask somebody else those questions. I don't know anything about that.

Q. And I see the next man on the list, one of the linemen, was paid $33, at the rate of $1.50 a day. A. That pay roll was from what time to what time?

Q. From the first of February to the first of March, 1899. A. Well, I don't know.

Q. What I want to find out is whether men who were on this pay roll were engaged in repairing the damage done by that storm, and if you don't know, I would like to know who does know. A. If they were, the general manager would know, I presume, and I furthermore take it for granted that at the proper time when the repairs are all finished, he would render me a statement showing what proportion of the expense of repairs should be credited to construction account and charged to maintenance, and therefore about twelve months from now, as I said to you, if you come around again, I will be able to show you some of those charges that you wanted to see just now, that I could not find.

1689

Q. Can you show me that any collection of that kind has been made during the year 1898, which is covered by the statement put in evidence? A. No, because we did not have any of those storms, and did not have any of those repairs to make.

Q. Suppose as a matter of fact the construction gang was working more or less during that entire year on repairs, can you show me anywhere in your books where there has been anything charged to maintenance on that account? A. No, sir, I could not, because for the reason that I have just given, the amounts would probably be separated. The men that were actually employed of the construction gang employed, would be put on a separate pay roll.

Q. Now I would like to see an illustration of that. I infer— A. I suppose that might be the case.

Q. In infer from what I have seen here, and what I expect the court to infer is that the entire work of the construction gang during the year 1898 was charged to construction, and none of it to maintenance, although as a matter of fact their work was almost entirely in maintenance and not in construction. If there is anything here in your books or documents or anything known to you which will show that that is not the case, I would like to have that produced, so there will be no misunderstanding about it. A. You would have to ask the president or somebody who knows about that. I don't know anything about it.

1690

Q. If there is anything in the books contrary to that you don't know where it is? A. Well, no, I have no such entries that I know of, unless they come to me in a way that I would

know nothing about. I don't know what the hands were used for. As I said before I never read over the pay roll.

ADDISON MAUPIN,
By the Examiner by Consent.

Subscribed and sworn to before me this ——— day of——— A. D. 1899.

Special Examiner.

JOHN C. ROBERTSON, being recalled for further examination, deposes and says as follows:

By Mr. WORTHINGTON:

Q. I want to know how we will be able to find out, if in any way, whether or not the work done by what is called the construction gang of your company during the year 1898, was all charged to construction and none of it to maintenance? A. It was all charged to construction during 1898, for the reason that those items during 1898, with the exception of
1691 three months when I was sick, were all submitted to me before the pay rolls were made out, and I adjusted them myself. I was particular in keeping the accounts separate. During the months of October, November and December I was in the hospital and cannot vouch for what was being done then.

Q. October, November and December, 1898? A. Yes, sir.

Q. We will take the preceding month. How was the separation made during that time? A. It was made by me, from the time which was turned in, before we got them into the pay rolls.

Q. Before you got them into the pay rolls? A. Yes, sir.

Q. And were separate pay rolls made then? A. Yes, sir.

Q. So that the men who worked on the construction gang would appear on two pay rolls? A. No, sir; the men who worked on the construction gang would be the construction gang, and those that worked on maintenance would be on maintenance. If we have to do any work on maintenance we do not take it with the whole construction gang. We sometimes take a climber or something of that kind from the construction gang to assist our linemen, but we never have had the construction gang engaged in maintenance.

Q. Then the names of the men who appeared upon this construction gang pay roll one month might appear up-
1692 on the maintenance gang or shop roll for the next month. A. Possibly they might.

Q. In that case the name of the same man would appear upon the construction pay roll for a part of a month, and upon

the maintenance roll for another part of the same month, would it not? A. Yes, sir, it would.

Q. Now I should like to look at the construction rolls and the shop roll for that period, for those nine months, and see how many instances of that kind we can find? A. Not nine months, because we only took the construction department on the first of March.

Q. Say from the first of March until the first of October? A. All right, I will get our cashier to look and see.

Q. Will you ask him to do that? A. Yes, sir.

(The witness left the room and returned.)

Q. I will ask you another question while he is doing that, to save time. A. Our cashier will look over the rolls and see if he can find such a case, but he reports to me a case in point that has occurred within the past week, where a man worked one day for the construction gang and five days for the maintenance gang, a lineman by the name of Smith.

Q. Did the construction gang of which Samuel Hirschburg is foreman do any of the work of repairing the damage
1693 done by the storm of February 13th, last? A. Not very much, as we hired a separate gang for the maintenance and put them in charge of a former lineman of the Bell company, named Cook. He, with his gang, has been busy at work with the maintenance department ever since the storm.

Q. Is that a separate pay roll from the two that have been produced here? A. Yes, sir; here is one of them. Here is the last one. We call it the extra pay roll. It is an extra force. Sam Hirschburg and his gang are putting up telephones.

Witness here produces a pay roll marked "Extra," covering the period from March 20 to 26.

The WITNESS: We pay them every week.

Mr. WORTHINGTON: The total amount of this pay roll is $64.25. A. We pay them every week.

Q. What gang was it that was at work during the two weeks immediately after the blizzard, when about fifty per cent. of your subscribers were cut off by the damage?

Mr. HEMPHILL: He did not say fifty per cent were cut off. He said fifty per cent were more or less damaged.

The WITNESS: Fifty per cent were more or less damaged. Not more than ten per cent were cut off.

By Mr. WORTHINGTON:

Q. Well, fifty per cent more or less damaged, or their business interfered with. A. I don't know that I could tell you

that, as I was not over here during the blizzard. I was
1694 sick at home, but I instructed Mr. McClure to employ a new gang and put them on at once,

Q. Is Mr. McClure here in the building? A. I don't know whether he is or not.

Q. I wish you would see, because we want to get at the information in the most direct way, and he would know more about it than anyone else, I presume. A. Yes, sir.

Q. Would you have any objection to inquiring whether he is here? A. None in the world.

(Witness here leaves room and returns, and says):

I wish to state after consultation with our general manager that the construction gang for the latter half of February should have been charged to maintenance.

Q. How about the first half? A. The first half was not so bad. They were busy—

Q. What was the construction gang doing during the first half of February? A. They were putting up 'phones.

Q. What 'phones? A. 'Phones; preparing to put in new 'phones.

Q. You mean 'phones ordered by new subscribers? A. Yes, sir.

Q. How did it happen, if it has been your custom to direct that the work of the construction gang should be ap-
1695 portioned between the construction and maintenance according to the work they do, that that was not done for this pay roll for the construction gang for February? A. For the reason as I said that from the 17th of October I ceased to separate the accounts myself, and during the time of the blizzard I did not come over here, and the fact is that it was not until sometime about the 12th of March, perhaps, that I took hold regularly. I have not been much in the office for four months.

Q. How long has Samuel Hirschburg been foreman of the construction gang? A. He has been foreman of the construction gang ever since the telephone company undertook to do its own construction.

Q. Is he about the building now? A. No, sir.

Q. Do you know where he is at present? A. No, sir; he is somewhere at work.

Q. Is there a man about the building who was on this construction pay roll for February last? A. No, sir there is not. They have no business about this building.

Q. I presume not, but they might happen to be here. A. Now about the construction department, the construction accounts in question, I wish to state that just as soon as I came

over to the office after the blizzard I instructed Colonel McClure to employ a separate maintenance gang, which he did immediately, and put them to work, and Sam Hirschburg and his construction gang were taken from that department
1696 and have had nothing to with it since.

Q. If your cashier has found your pay rolls I should like to see how many illustrations we can find of one man's being on two different pay rolls during the same month during 1898? A. Here are two pay rolls for the construction department, marked $306.50 less amount of repair work $60. Here is a pay roll for the three weeks ending November 27, December 4, and December 11, 1897, and another for the weeks ending December 18 and December 25, 1897, and January 1st, 1898. That one is less repair work $16.10.

Q. Is that all you wish to say? A. Yes, sir.

Q. I see the total amount of the first of these two pay rolls is $306.50, and the amount deducted for repair work is $60. Is that right? A. Yes, sir.

Q. The total of the other is $116.75, and the amount deducted is $16.10? A. Yes, sir.

Q. You have not yet produced two different pay rolls for the same month upon which the name of the same men appears? A. In that case instead of the man having his name on two different payrolls we simply charged the maintenance account for the work done by the men according to the days that they had been on it. When I separated the two
1697 accounts, then the cashier made up the pay rolls in his own way, but charged off the different amounts.

Q. I am still waiting to know whether any pay rolls have been found which show that during the same month the same men appeared on two different pay rolls? A. I don't think they will be any different from what I show you, which show that the same men have been working for the different departments.

Q. Then I would like to know the total amount of the pay rolls of the construction gang during the year 1898, and how much of it has been deducted as properly chargeable to repairs. A. I don't know that I can give you the total construction for 1898 because as I said two months of it—

Q. I mean beginning March 1st, 1898, for the ten months then. A. All right, I will instruct my cashier to make them out for you.

Q. If you will ask him to do that, then I would like to go on with something else. A. What is it you want exactly?

Q. I want the total amount of the construction rolls for 1898, and then how much of it has been charged off to repairs or maintenance? A. You want all the pay rolls for 1898?

Q. Yes; that is from the first of March. Now Mr. Robertson, is there anything in your office which will show what lines you had up on the first of March, 1898? A. What
1698 lines?

Q. Yes, pole lines. A. No, sir. Mr. Moore had those.

Q. He turned them over to you then? A. Yes, sir. I took them in fact.

Q. Well, you took them? A. I did.

Q. Is there anything which will show what new pole lines this company has constructed? A. No, sir.

Q. Since that time? A. No, sir. We put them up as we need them and take no particular record of them. It is not necessary.

Q. They have been mainly I suppose in reaching new subscribers? A. Yes, sir. Our main lines are established, and we just have to run little branch lines from the cable.

Q. In reference to the Manchester exchange, who owns that? A. The stockholders of the South Side Telephone Company.

Q. Are they the same as the stockholders of the Richmond Telephone Company? A. No, sir.

Q. Any of them of same? A. One.

Q. Who? A. I am.

1699 Q. How much of that company do you own? What proportion of the stock? A. I own about a third, not quite a third.

Q. How far is the Manchester Exchange from this exchange? A. About two miles and a half, maybe three.

Q. Is there any extra charge when a person who is in one exchange wants to reach somebody who is in the other? A. No, sir.

Q. You reciprocate? A. Yes, sir. Here are these pay rolls (producing certain pay rolls).

Q. Well, I want to know whether there is any instance of the same man appearing on two different pay rolls in the same month? A. It would take me a week to find out. As I said I am not a detail man.

Q. Who is the man of detail about your company, if you have any? A. Well, there is a man of detail in each department. Mr. Hirschburg employs his men under the direction of McClure, and Mr. Bradshaw employs inspectors under the direction of Colonel McClure. Mr. Cherry, the cashier, works under my immediate supervision. I see every day every item that has been entered, every receipt. I draw a check for every dollar paid from the office.

Q. Then you seem to be considerably a man of detail.

1700 We are taking a great deal of time about this, Mr. Robertson, but I want to find out a very simple thing, and

that is how much of the work of the construction gang has been charged to maintenance. You have told us that the construction gang works more or less during the entire year on repairs. A. No, not more or less during the entire year. I say that the construction gang worked for the maintenance account after the blizzard until we could employ another gang, which we did, but the construction gang as a general thing has nothing whatever to do with the maintenance gang. And so far as charging too small an amount to maintenance, a great deal of the work of construction is done by my own linemen and charged to maintenance. For every 'phone that is put in the house is wired and the 'phone is put up by my lineman, or some man on the shop pay roll. The construction gang simply runs a drop from the cable head to the building.

Q. I see you have been looking at the pay rolls. Have you found any instances of the same men being on two different pay rolls in one month? A. No, I could not find out that because I would have to look over the three pay rolls.

Q. You have three pay rolls for each month, haven't you? A. I mean I would have to look over the shop pay roll as well as the construction pay roll. You asked me to give you the construction pay roll for the nine months. Now
1701 the construction gang working for the maintenance department during the month of February was one of the incidents caused by the terrible blizzard.

Redirect examination.

By Mr. HEMPHILL:

Q. State whether that blizzard was an ordinary or an extraordinary occurrence in the history of your company? A. It was the first time that we have been damaged to the amount of $100 by weather since our exchange started. And according to the papers and the memory of the oldest inhabitants it was the worst snowstorm that we have had here since 1857-7.

Q. Well, you wanted to make a little explanation, as I understood you about your connection with the construction company and some other matters that you said you wanted to state. A. Yes, I wanted to state that in giving my evidence this morning about the payments that were made to the construction company, the fact escaped me that the last hundred 'phones that we put in, that the construction company put in, we paid $25 in money, in addition to the $75 in bonds.

Q. Whom do you mean by the construction company? Was that a single contractor? A. It was a single contractor.

Q. Who was that? A. Mr. Warner Moore.

Q. That was the last hundred up to what amount?

1702 That would bring it up to what number? A. Up to the 1,200.

Q. Well, was there anything else in the shape of payments that were due him by reason of your contract? A. Yes, sir, we owed him a bonus of $7,500 for assistance to us before we commenced work, that is in securing our franchises. We have to put up a guaranty here to the city.

Q. Was there any option about that as to whether it was all to be paid, or partly in cash, or what was there about that? A. The option was that we would pay him $5,000 in cash or $7,500 in bonds.

Q. How much have you paid him in cash? A. Altogether?

Q. Yes. A. I think our books show that we have paid him about $20,000.

Q. Is there any further explanation you want to make? Does that cover the whole contract now? A. I think it does.

Recross examination.

By Mr. WORTHINGTON:

Q. Where did that $20,000 come from that you paid Mr. Moore? A. The earnings of the company.

Q. Was that money in addition to the $95,000 in
1703 bonds? A. Oh, no, we paid $2,500 in addition to the $95,000 in bonds.

Redirect examination.

By Mr. HEMPHILL:

Q. Did you owe him any interest along, and that sort of thing? A. Oh, yes, we have owed him interest along. That $2,500 was for telephones, and the $5,000 or $7,500 in bonds, that has never been settled yet.

Q. And then you have paid him interest? A. Yes, sir; the balance of this went on account of interest.

Recross examination.

By Mr. WORTHINGTON:

Q. The balance of the $20,000 was interest on bonds? A. Yes, sir.

Redirect examination.

By Mr. HEMPHILL:

Q. Will the $7,500 in bonds, if that is paid, be in addition to the $95,000, or included in the $95,000? A. In addition.

JOHN T. ROBERTSON,
By the Examiner by Consent.

Subscribed and sworn to before me this —— day of —— A. D. 1899.

Special Examiner.

1704 Thereupon the further taking of depositions was adjourned until to-morrow, March 28, 1899, at the office of the Southern State Telephone Company, Norfolk, Virginia.

1705 Depositions taken at the office of the Southern State Telephone Company, Norfolk, Virginia, March 28, 1899, on behalf of the complainants.

Present on behalf of the complainants, Mr. HEMPHILL.
Present on behalf of the defendant, Mr. WORTHINGTON.

WILLIAM PANNILL, a witness of lawful age, called on behalf of the plaintiff, after being by me first duly sworn according to law, deposes and says as follows:

Direct examination.

By Mr. HEMPHILL:

Q. Please state your age, residence, and occupation. A. 35, Norfolk, superintendent Southern States Telephone Company.

Q. How long have you been connected with the company? A. Twenty-eight months.

Q. How long have you been the superintendent? A. Two years.

Q. Where does this company do business? A. In Norfolk, Portsmouth, Berkeley, and Norfolk County.

Q. What is the population of Norfolk? A. Forty-five thousand.

Q. Of Portsmouth? A. Eighteen thousand.

Q. Of Berkeley? A. Six thousand.

1706 Q. How far into the county do your wires extend? A. A radius of about six miles from the main central office in Norfolk.

Q. How many 'phones have you in operation? A. About 1,300.

Q. How many additional 'phones have you contracted for? A. About seventy.

Q. State whether the business of your company is increasing or diminishing? A. Increasing.

Q. What are the rates charged per 'phone? A. Thirty dollars per year for business 'phones, $25 per year for residence 'phones, and $10 per year for desk sets on the same line with a wall 'phone.

Q. About what do the average receipts per 'phone amount to per annum?

Mr. WORTHINGTON: I object to that unless it appears that the witness keeps the books and knows from his personal knowledge.

A. I was going to answer that I do not keep the books.

Mr. WORTHINGTON: In that case I object unless the books themselves are produced, so that we may the information at first-hand, and not by hearsay and inference.

A. I would have to refer to the books.

By Mr. HEMPHILL:

Q. State whether your construction is overhead or
1707 underground. A. Both.

Q. How much underground? A. About ten per cent. of our business territory.

Q. How much is that by miles, or in actual distance?

Mr. WORTHINGTON: Do you refer to conduit miles or duct miles?

Mr. HEMPHILL: Do you measure by the duct or conduit? A. I could not answer that unless I made a measurement. I could furnish the information from records which we have.

Q. State whether you use cables in your overhead construction or not, or single wires. A. Partially.

Q. You use cables partially? A. Yes, sir.

Q. To what extent? A. Well, you may say on an estimatte that ten per cent. of our overhead wires are cables.

Q. In making connections between Norfolk and Portsmouth and Berkeley state whether you have to go under water, or not? A. We do. We use submarine cables.

Q. What are your duties as superintendent? A. General management of the construction, operating and maintenance departments.

Q. In keeping the accounts of the company who separates the maintenance from the construction and other ex-
1708 penses, if it is done? A. The bookkeeper.

Q. Under whose direction? Do you have anything

to do with it? A. I have nothing to do with the accounts of the company.

Q. State whether there is a construction gang? A. Yes, sir.

Q. Is there a maintenance gang? A. Yes, sir, and an operating force. They are divided into different departments.

Q. Is there any other division of them except construction and maintenance? A. No, sir.

Q. How many people do you employ? A. It varies. We have now 27 operators, I think.

Q. I am not speaking about the operators, but the outside people. A. They vary from two to ten or twenty as the occasion arises. They are all paid by the day whenever their employment is necessary.

Q. Do you have a superintendent of each gang, a boss? A. Yes, sir.

Q. And the others are paid by the day? A. Yes, sir.

Q. Is he paid by the day also? Yes, sir.

1709 Q. What do you pay the boss of the construction gang? A. $2 per day.

Q. What do you pay the boss of the maintenance gang? A. $2 per day.

Q. What do you pay the laborers who go with them? A. Ground hands get $1.50 and linemen $1.75.

Q. Per day? A. Yes, sir.

Q. That applies equally to both forces? A. Yes, sir.

Q. How many operators do you have in the exchange room? A. Which one—do you mean them all?

Q. Yes. A. 27 altogether.

Q. Is there any chief operator? A. Yes, sir.

Q. More than one? A. Only one.

Q. Is that a man or a woman? A. A woman.

Q. What do you pay her? A. $30 per month.

Q. You have 26 operators besides the chief? A. 27.

Q. 27 including the chief? A. No, sir; she makes 28.

1710 Q. 27 regular operators? A. Yes, sir.

Q. Girls? A. Yes, sir.

Q. What do you pay them? A. They are paid by the day, from 58 1-3 cents to 75 cents per day. They earn from $15 to $21 per month, that is the average.

Q. What make of switchboard do you use? A. The Western Telephone Construction Company, manufactured in Chicago.

Q. How many drops have you? A. We have 1,100 in the main office, 300 in the Portsmouth office, and 200 in the Berkeley office.

Q. Can you add to that different boards from time to time

or not? A. Yes, sir, we can add to the boards. We have what we call spare drops. It would be necessary to build outside construction to reach those drops.

Q. Suppose you had all those filled up, what would you do? A. Well, then it would be necessary to build more outside construction and put in more switchboards.

Q. Can you add a hundred at a time if you choose, to this board? A. Yes, sir a section at a time.

Q. A section at a time, that is what I mean. A. Yes, sir.

Q. How many drops does each girl attend to? A.
1711 Ninety; that is their limit. Some of the boards have not got ninety. That is the regulation limit, ninety drops, and we are thinking of reducing that number though, because operators cannot well attend to more than 75.

Q. Are all of these girls engaged at the same time, these 27, or do they take relief? A. By reliefs, night and day.

Q. What make of telephone do you use? A. We use three different kinds; what we call a J. & H. 'phone, made by Johnson & Haslett.

Q. Where is that made? A. They were made here; then we use the Western Telephone Construction Company of Chicago, and the Telephone Manufacturing Company's instrument of Sumter, S. C.

Q. Is the last one a good instrument? A. The best I have ever seen, with the exception of course of the Bell Company's solid back. We have three or four hundred, and I do not think two of them have ever been on the trouble sheet.

Q. What is the bonded debt of the company, if any? A. I could not answer intelligently, sir. The bookkeeper can answer that.

Q. What is the length of this submarine cable you speak of to Portsmouth? A. About 6,000 feet, which would include both offices, Berkeley and Portsmouth; touching at Berkeley and then going to Portsmouth.

1712 Q. How many wires in that? A. 26 pairs.

Q. What kind of poles do you use? A. Juniper, from 25 to 50 feet long, and a few 60.

Q. How does juniper compare with chestnut, if you know? A. They are not as long-lived as chestnutt. It is a question whether we could use chestnut at all in this soil. The life of a juniper pole is about nine years, provided it is stepped, provided the spurs are not used in it.

Q. That is, provided it has steps for the linemen to go up on? A. Yes, sir; when they stick the spurs into them the water gets in and rots them.

Q. When did this company begin business? A. I could not give you the date. The bookkeeper can furnish it to you.

Q. He has the dates? A. He can give you all the information, I suppose you want that exact.

Q. Do you remember how many 'phones you had when you started business? A. About 580, but a large number of those were free 'phones, simply on trial. When we started we practically had no paying business.

Q. State whether these non-paying subscribers are still carried, or whether you have taken them off? A. Some of
1713 them are still carried, but the majority of them are either paying or discontinued. The point you want is how many free 'phones we have now?

Q. Yes, practically. A. Seventy-two.

Q. What is included in that? A. That includes the 'phones that we give the city and people of influence.

Q. How many do you give to the city? A. Five.

Q. Do you pay any taxes to the city? A. Yes, sir.

Q. How much? A. We pay the city three per cent. of our gross receipts, $600 a year license tax, $1 per year pole tax for each pole. We furnish the city one duct in our entire underground system for police and fire alarm, and two pins on our top cross-arms of our overhead lines, on all of them.

Q. Do you pay any State and County taxes in addition? A. Yes, sir; there is a State tax of seventy-five cents on each transmitter, and there is a State tax on the value of our real estate. We pay a tax in Baltimore of $2,000, which I think is called a stock tax in Maryland, and altogether, putting it in round numbers, we pay about 14 per cent. of our gross recepits in taxes.

Q. How many poles have you? A. I think 542.

1714 Mr. WORTHINGTON: Is that in Norfolk or in the other places? A. That is in Norfolk.

By Mr. HEMPHILL:

Q. Do you pay any tax on poles in the other cities? A. No pole tax. The gross tax on all our business is about 14 per cent. That would cover it.

Q. What do you have to pay for poles? A. We pay from $1.75 to $5, or in other words about 8 cents per foot.

Q. Does that mean here or at the depot? A. Landed in Norfolk, Portsmouth or Berkeley as is required.

Q. What kind of a wire do you use? A. We use a common grade of BB iron wire, what you call second grade. That is what we have been using.

Mr. WORTHINGTON: What is the gauge? A. 12.

By Mr. HEMPHILL:

Q. What salary does the company pay you? A. They pay me $115 per month and expenses.

Q. Can you state any rate at which your 'phones are increasing, the number of 'phones in use? A. Well, that varies a great deal. We have put in in the last ninety days about a hundred. You can add there that we are not forcing our business as strong as we could, for the simple reason that the cost of construction is getting so great now that it does not pay us to put in 'phones except in the immediate neighborhood. That is the reason we are not forcing it. The demand is all right, but the supply is limited, as far as we are concerned financially.

1715

Cross-examination.

By Mr. WORTHINGTON:

Q. Have you any means of determining with certainty the average distance of your subscribers in Norfolk from the central office in Norfolk? A. Yes, sir.

Q. What is it? A. I would estimate that the average distance of our subscribers would be less than one-eighth of a mile.

Q. Less than one-eighth of a mile? A. Yes, sir.

Q. How many subscribers have you? A. About 1,300 stations.

Q. How many in Norfolk? A. About 900.

Q. What proportion of those 900 are business and what proportion residences? A. About 80 per cent. are business 'phones and 20 per cent residence 'phones.

Q. Can you tell us what is the average distance from your central office in Norfolk of your Norfolk business subscribers? A. Why, yes, sir; it is—well, we will say one-sixteenth of a mile. Norfolk only has a few business streets, right around this section.

1716

Q. How many subscribers have you in Portsmouth? A. We have about 200.

Q. Can you tell me the average distance from the Portsmouth exchange of those subscribers? A. Yes, sir; I should say as an estimate one-sixteenth of a mile.

Q. How many subscribers have you in Berkeley? A. About 100.

Q. What is the average distance of those subscribers from the Berkeley exchange? A. About a half a mile.

Q. You have, I think, no extra charge for inter-communication between these three exchanges? A. No, sir.

Q. Have you any sub-exchange or auxiliary exchange except these three? A. We have connections with outside companies.

Q. With toll lines? A. Yes, sir.

Q. Those are the only three exchanges that are furnished at

the rate which you charge your subscribers? A. That is it, sir.

Q. What kind of wire do you use in your underground cables? A. We use a hundred-pair cable made by the Standard Underground Cable Company of Pittsburg.

Q. What is the kind of wire you use in those cables?
1717 A. Copper.

Q. What is the size? A. 20.

Q. Will you kindly produce a specimen of the iron wire which you use in your overhead system?

(Witness produces a piece of wire about six inches in length, which is offered in evidence by counsel for defendant, and is herewith filed marked Exhibit Pannill 1.)

Q. Do your duties require you to have anything to do with the operating room and the operators in charge of the switchboard? A. Yes, sir; general supervision of them.

Q. You have a general knowledge then of the working of the switchboard? A. Yes, sir.

Q. Why is it that you contemplate reducing the number of subscribers that one operator takes care of from ninety to seventy-five? A. On account of the number of calls that are made by the local stations, we think it necessary, in order to give good service, that the number of stations for each operator should be seventy-five instead of ninety.

Q. That has been the result of your experience? A. Yes, sir.

Q. What kind of a switchboard do you use? A. Western Telephone Construction Company.

Q. I wish you would describe in a general way its
1718 operation, if you can. A. We have self-restoring drops, which fall when the 'phone is rung by the subscriber. The operator plugs in, throws back a cam one point, and asks a number. When number is given, the operator takes opposite cord and plugs in the number wanted, if it is in reach of her seat. If not, it requires her to transfer the call to the case where the number is located.

Q. How many operators' positions have you in your Norfolk board? A. Eleven.

Q. And in front of each operator are how many subscribers' wires? A. One hundred.

Q. Then you are not using them all? A. No, sir.

Q. How many subscribers can each operator reach without transferring the call to a second operator in the same exchange? A. Reach three sections, her own, the one on the right, and the one on the left, which means, say, 250.

Q. Have you found in your experience that subscribers who communicate frequently with each other like to be under the

same operator, so that they can be communicated with more quickly than if the call has to go through a second operator? A. Yes, sir; in all cases we try to locate a person to reach a certain class of people with whom he does business.

1719 Q. The object being to avoid delay and mistakes which arise from having one operator communicate with another? A. Yes, sir.

Q. Suppose a subscriber in Portsmouth wishes to communicate with a subscriber in Norfolk, what is the process then? A. The Portsmouth operator calls up the Norfolk office on the section which the party wanted is located. He in turn gives the number to the Portsmouth subscriber.

Q. Each operator in the Portsmouth exchange then can communicate with each operator in the Norfolk exchange? A. Yes, sir, they have trunk lines connected with each board.

Q. Then the process when the subscribers are in two different exchanges is precisely the same as it is when they are in the same exchange, but their wires terminate in the different operators' positions? A. It takes the same number of motions.

Q. How long has the present switchboard in the Norfolk office been in use? A. Two years.

Q. Were you here when it was installed? A. Yes, sir; helped to install it.

Q. Have there been any changes made in it it since it was installed? A. Yes, sir.

1720 What are they? A. We put in what we call a transfer system.

Q. What is that? A. That is transferring one subscriber from one part of the board to the other.

Q. That is the process you have been describing by which one operator communicates with another, when the wanted subscriber is not in her section? A. Yes, sir.

Q. What was the trouble with the original board in that respect? A. It was defective.

Q. Could you describe the nature of the trouble that you had with it? A. There were two troubles, the clearing out system and the signal system. In the clearing out system there were eighty-one drops which would not fall in case the subscriber's station had a weak generator or leaky line. In that case when the ringing subscriber had finished his conversation and wanted to get another party, it would invariably ring the first party back. Having only one signal for 12 pairs of cords, when she had a number of cords up, she could not locate the trouble.

Q. That was one difficulty? A. I have explained them both, the clearing out and the signaling.

Q. Who made these changes in your board? A. The Western Telephone Construction Company.

Q. Did Mr. Keeling know anything about it or have
1721 anything to do with it? A. Yes, sir.

Q. What kind of a switchboard do you use in the Portsmouth exchange? A. The same, and the same in Berkeley.

Q. Were they installed at the same time when the Norfolk board was, or subsequently? A. At the same time. We have since put additionals to both Berkeley and Portsmouth.

Q. Additional sections? A. Additional sections.

Q. Were they built precisely as the Norfolk Board was originally? A. The same as the Norfolk Board, without the transfer system.

Q. You did not put in any different transfer system? A. No, sir; it did not require any because the girls can reach.

Q. Is it so small that one girl can reach all the subscribers? A. Yes, sir.

Q. How are those 27 operators distributed in the three exchanges? A. We work nineteen in the main office, five in Portsmouth and two in Berkeley. Then we have an extra relief. I think that is the way they are distributed, sir.

Q. How many operators' positions have you at the boards in Portsmouth and Berkeley? A. Three in Portsmouth and two in Berkeley.

1722 Q. Then, if you have 16 operators' positions to 1,300 subscribers, each operator averages about 81 subscribers at present? A. Yes, sir.

Q. What advantage has the telephone manufactured by the Telephone Manufacturing Company of South Carolina over that of the Telephone Construction Company? A. It is constructed better and gives better service generally.

Q. What troubles do you experience in the telephones of the Western Telephone Construction Company? A. Packed transmitters.

Q. That is not very intelligible to us. Will you explain it? A. The granulated carbon becomes packed and no sound can go through.

Q. Have you had any trouble with your submarine cable between here and Portsmouth and Berkeley? A. Yes, sir; considerable.

Q. What difficulty? A. I think it has been necessary to renew the submarine cable between Norfolk and Portsmouth three times, so much so that they are considering the advisability of changing the entire route.

Q. What has caused the difficulty? A. Ships dragging their anchors and breaking the cable and mashing it and so forth.

Q. How much does it cost to replace it? A. It depends upon the damage.

1723 Q. You do not mean then that you have to replace the whole cable? A. No, sir.

Q. Well, I don't care, then, for the details. You have given the lifetime of a juniper pole, which you say is about nine years? A. Yes, sir.

Q. Of course the company of which you are now the superintendent has not had any poles up anything like that length of time. All its poles are comparatively new? A. About three years old.

Q. What is the source of your information as to the lifetime of these juniper poles? A. By general observation and what I have read about it.

Q. Have you had any actual experience to see how long they will last? A. No, sir.

Q. Just from general information? A. General information.

Q. Does the juniper pole cost more or less here than the chestnut pole? A. Less.

Q. What is the difference, taking a pole of the same size, say fifty feet, what would be the cost of juniper as compared with chestnut? A. We can get juniper poles for about sixty per cent. of the cost of chestnut. Juniper is raised here and the chestnut would have to be sent here.

1724 Q. You have given the length of your poles as from 25 to 50 feet. Does that mean the length of the pole before it is put in the ground? A. Yes, sir.

Q. How far in the ground do you put the 25 and 50 foot poles respectively? A. One-sixth of their length.

Q. What proportion of your whole number of poles in Norfolk are 25 feet? A. We have practically no poles in the city limits of 25 feet. Do you want the average height?

Q. Yes. A. Forty-five feet.

Q. Forty-five feet is the average? A. Yes, sir.

Q. Taking off one-sixth, that would give the average height of the pole above the ground? A. Yes, sir.

Q. How many cross-arms do you carry on those poles? A. An average of about eight.

Q. You have as high as twelve on some, have you not? A. Eleven on a few sixties that we have.

Q. Don't you carry as many as 120 wires on some of these poles in Norfolk? A. I don't know of a case.

Q. What is the maximum number? A. 110.

1725 Q. Well, you have some poles, have you not, with eleven cross-arms and each cross-arms carrying ten wires? A. Yes, sir.

Q. That would make 110 wires? A. Yes, sir.

Q. Then haven't you also two additional wires on knobs on the under side of the cross-arm? A. There are two instances here where we have probably three or four wires on poles where we carry cables besides. That is the point I guess you are after.

Q. Do you consider that good construction to put so many wires on a pole of that size? A. We are taking them down as fast as we can.

Q. Taking them down and doing what with them? A. Taking them down and using cable instead. No fifty-foot pole should have more than six cross-arms.

1726 Q. Did you have any great amount of sleet in the recent storm of February 13th last? A. No, sir.

Q. That did not reach Norfolk A. No, sir; we had no trouble here except possibly some poles blown over and some losses to our cable.

Q. Do you have steps on all your poles? A. No, sir; only terminals.

Q. What is your judgment as to the lifetime of a juniper pole when you do not use steps? A. The main lines that we have put in now will probably show weakness in six years.

Q. Where does a telephone pole usually give way? A. Well, it usually gives way at the ground, rots in the ground.

Q. Near the place where the pole enters the ground? A. Yes, sir.

Q. Why did you express doubt as to whether you could use chestnut poles here? A. I have no direct knowledge other than what the pole people tell me, on account of the soil. You see we are only six feet above sea level, and when we go down six feet we strike water. It is a question whether a pole of that kind would live under water.

Q. Where you have a 45-foot pole say one-sixth in the ground and have either 12 or 10 cross arms on it, about how far are your wires from the ground? A. We never have any wires under thirty feet. The law requires us to have them at least 30 feet from the ground.

1727 Q. And that is about the average distance of your wires above the ground in the city? A. Yes, sir.

Q. Outside of the city limits that is not so? A. No, sir; We use 25 and 30 foot poles.

Q. How is it in Portsmouth and Berkeley? Are there any regulations there as to the height of the wires? A. Yes, sir.

Q. The same as in Norfolk? A. Yes, sir.

Q. Was not that regulation made after a large part of your plant was put up? A. Yes, sir; after the plant was practically completed.

Q. You had put some or a good many of your wires under that limit, had you not? A. In only one place, and that has since been changed.

Q. Who is the president of this company? A. Charles R. Fink, of Baltimore.

Q. How long has he been president? A. Since its organization.

Q. Is he also a stockholder in the company? A. Yes, sir.

Q. Do you know what his salary is as president or whether he receives any? A. Yes, sir; he receives a hundred dollars a month and expenses.

Q. What other salaried officers have you; I mean those who are paid by the year? A. The secretary and the treas-
1728 urer.

Q. Who is he? A. Fred. S. Axtell, of Baltimore.

Q. What is his salary? A. $300 per year.

Q. Any others beside those? A. No, sir.

Q. What about the cashier? A. He has a salary of $75 a month.

Q. What is his name? A. P. Fred Bonney.

Q. Those are the only officers who are paid by the year? A. Paid by the month.

Q. Well, they receive a yearly salary payable in monthly installments? A. Yes, sir.

Q. What did you mean when you said that the cost of construction is getting so great that you do not care to push for new business except in the immediate vicinity of your exchange? A. I mean that getting new business will require building additional underground system, putting in additional underground cable and additional overhead cable.

Q. You mean, then, that your plant as at present constructed will not accommodate any large increase in the number of your subscribers? A. Unless we make the additions.

Q. I say as at present constructed? A. Yes, sir.

1729 Q. You mean it is built for the accommodation of only about the number of subscribers you have, and if you you should get a considerable increase in the number of subscribers you would have to enlarge your whole plant? A. That is the idea, sir.

Q. Are you familiar with Washington City at all? A. No, sir.

Q. Have you been there recently and noticed anything of the telephone construction there? A. Yes, sir.

Q. Are you familiar with it in a general sort of a way? A. In a general sort of a way, yes, sir.

Q. How does it campare with the construction there? A. It is very good construction, sir; compares favorably with the overhead.

Q. You have not seen their underground construction? A. No, sir; I have never examined their underground construction.

Q. You don't know what is the average distance from the exchange to the subscribers there? A. No, sir.

Redirect examination.

By Mr. HEMPHILL:

Q. Do you claim to have pretty good construction here? A. Yes, sir.

1730

Q. The defects that appeared in this switchboard, as I understand you, have been corrected? A. Yes, sir; as far as possible in this board.

Q. Was Mr. Keeling here himself when it was done? A. When the alterations were made?

Q. Yes. A. No, sir; Mr. Keeling has never seen the board since it was changed.

Q. How many 'phones of the Western Construction Company have you; that is Mr. Keeling's company, isn't it? A. I think we have about 600. They had two kinds of 'phones, the extension arm 'phone, and a 'phone they called the Western Giant which they recently remedied all the defects in them, putting in new hook switches.

Q. Was that an improvement to it? A. Oh, yes; we could not use the 'phone as it was before.

Q. Are they all right now? A. Yes, sir; the switch that he puts out now is all right.

Q. So that the 'phones that are now used from his company are all right? A. Yes, sir.

Q. You say the carbon would become packed in these? A. Yes, sir.

Q. How did you unpack it? A. Simply by taking it out and putting in new carbons.

Q. It is simply a pulverized or granulated carbon, isn't it? A. Yes, sir; granulated carbon.

1731

Q. Haven't you known that to occur in other 'phones? A. No, sir; it has never occurred in the Sumter one, never occurred in that American 'phone there.

Q. That is the limit in your experience with 'phones for general use, is it? A. Yes, sir.

Q. How many times have you had to repair that submarine cable between here and Portsmouth? A. We have had to practically replace the whole route, I think, three times. We have repaired one six times in ten days.

Q. Is that an expensive part of your plant? A. Yes, sir; I think one year here our submarine cables cost us to repair more than $4,000.

Q. If you did not have that how would you reach Ports-

mouth? A. We would have to have a submarine cable, but not in a location as dangerous as the present location. It would necessitate the construction of about four miles of overhead lines, which would have to be heavy construction, carrying so many wires. It would cost—I think our estimate was $8,000.

Q. Do you mean to say that there was no loss at all from the February storm? A. Not with our plant here. We lost a cable at that point, which cost us $1,500 to replace.

Q. That is not the one that goes to Portsmouth? A.
1732 No, sir; We have connections with Hampton and Newport News, and our lines extend as far as that point. We cable across Hampton Roads, a cable two miles and a half long.

Q. Is that free service or is that a toll line? A. That is a toll line service.

Q. Do the companies on the other side belong to this company, or are they separate organizations? A. Entirely independent.

Q. You own the cable between the two? A. Yes, sir.

Q. Has that been expensive heretofore? A. Yes, sir. In other words, we have lost money on connections. The only advantage we have had is in being able to give our local subscribers out of town connections. The investment has been an unprofitable one.

Q. Well, if you had additional underground cable here would it be profitable to have new subscribers? A. Yes, I think it would be profitable provided we could get a little larger rate than we are getting now. In other words, I would not advocate the building of additional undeground service at the $30 rate.

Q. Would that depend upon how many subscribers you got? A. Well, in one sense, and in a general way, no. This is one peculiarity of the business, that the more subscribers you get are the profits in proportion decreased.

Q. Will you explain that? That is something that our
1733 friends on the other side have advocated. A. Well, suppose you have got a hundred subscribers. How many calls could those subscribers make a day? They could only call among those hundred subscribers, but it multiplies with a thousand subscribers. In other words, your operating expenses increase very rapidly.

Q. What operating expenses? A. Your operating expenses right in your operating room.

Q. What proportion does that bear to the total income of the company? A. All operating expenses are about 25 per cent, I should say, of our income.

Q. Do you mean that the salaries of the girls whom you employ amount to 25 per cent of the total income? A. Yes, sir.

Q. Let me see, now. You have 27 girls? A. Yes, sir.

Q. And their average is how much? A. About $20 a month.

Q. That is $540 a month? A. Yes, sir.

Q. Well, now, do you think then that a profit of seventy-five per cent on an expenditure of twenty-five per cent is not a good investment? A. Where you have got to put in a new underground system, and all at a cost of say about $100 per station, I do not think so.

1734 Q. Well, is that because of the cost of putting it in, or it is because of the cost of the girls? A. It is both. It is the cost of putting it in—you asked me if it would be profitable at our present rate, as I understand you, at $30 per year, to increase our underground system to look for a great deal more business, and I said no, I did not think so. I think the rate is too cheap.

Q. What I asked you is this: If you had an underground system now would it not be profitable for you to increase the number of your subscribers? A. Oh, if we had it already?

Q. Yes. A. Yes, sir.

Q. If you had that outlay? A. Yes, sir; if we had it now.

Q. Does not that depend entirely upon how large you pitch your plant at the beginning? A. Yes, sir.

Q. Suppose you pitch your plant in a town of this size for 3,000 subscribers, which would be the most profitable to run it at 1,300 subscribers or to get the full 3,000? A. At $30?

Q. Yes. A. 1,300.

Q. Would it be more profitable? A. Yes, sir; I would rather have it a thousand.

Q. Rather have it a thousand? A. Yes, sir.

1735 Q. Notwithstanding the fact that you had all this plant—

Mr. WORTHINGTON: I object to counsel arguing the case.

Mr. HEMPHILL: I am just putting the question. I am supposing you have the plant for 3,000 subscribers and you have paid your money for it and you have an underground system and an overhead system that is necessary to reach 3,000 subscribers. Do you think it is better to have a thousand subscribers at $30, and charge the expenses and interest and all that, charge the whole of that up to the 1,000 subscribers, or is better to have 3,000 subscribers? A. Well, that would require a lot of figuring on my part. But in a general way I would rather have a thousand subscribers to make an interest paying investment and declare dividends.

Q. You would rather have the 1,000? A. Yes, sir; I believe maintenance and operating expenses would eat up your profits and interest on your investment.

Q. In what way now? Suppose that you have a thousand subscribers and they each yield you $30? A. Yes, sir.

Q. That is, $30,000 income? A. Yes, sir.

Q. Now, suppose you have 3,000 subscribers and they each yield you $30? A. Yes, sir.

1736 Q. There is $90,000. Do you mean to say that the additional $60,000 would be entirely consumed in expenses? A. I don't mean that. I said your profit in proportion would be better on $30,000 than on $90,000.

Q. Why? Your plant, mark you, has already been laid out for 3,000. You have got your conduits, your poles and your overhead construction for 3,000 people. Now, according to your theory, it is better to have that idle and yielding no service and getting revenue. A. At the same time you have got to pay interest.

Q. But you have got to pay interest on. A. You have got to pay interest on all that.

Q. You have got to pay interest on the whole plant out of the $30,000 if you have only a thousand subscribers? A. Well, you are asking me which I would rather do.

Q. No, I am asking you which is the most profitable? A. I will have to stick to my first proposition that I think it would figure out that it would be more profitable to have the thousand subscribers.

Q. What would a plant cost you here for 3,000 people? A. That is a little too much for me.

Q. You know what this has cost, don't you? A. About; yes, sir.

Q. How much has this cost? A. I think this plant has cost about $120,000. That is outside information. I have

1737 never looked on the books to see the cost of it.

Q. About $120,000? A. About that.

Q. Do you know whether it has cost that in actual cash? A. No, sir.

Q. What do you think it has cost in actual cash?

Mr. WORTHINGTON: I object to what the witness thinks, especially after he has said that his only information is hearsay.

A. I can show the actual cost of the plant from the books of my company, the money that has been spent.

Q. Suppose we get that. Will you get that? A. Yes, sir.

Witness leaves the room, and on returning says:

$110,000 in round figures.

Q. Well, now, you say that cost $110,000, and you have 1,100 subscribers? A. Yes, sir.

Q. That stands practically a hundred dollars a subscriber? A. A hundred dollars a station.

Q. Of course, you have had a great many additional ones that you have taken out? A. Yes, sir.

Q. And you have put others in? A. Yes, sir.

1738 Q. But it stands today say a hundred dollars a station? A. Yes, sir.

Q. Now, having this plant for 1,100 subscribers, is it, in your opinion, better to have 500 subscribers or 1,100? A. Do you mean as an interest paying investment?

Q. Yes. A. I would rather have 500 at the same rate we are getting, $30 per year, than to have 1,100.

Q. Well, now let us see how that works out. $110,000 at six per cent is $6,600, isn't it? Now, you have got to pay that interest on your plant. That is, what it has cost you? A. All right, sir.

1739 Q. Five hundred subscribers at $30, on an average is $15,000, isn't it? A. Yes, sir.

Q. Well, you deduct $6,600 from that, and that leaves you $8,400. Now if you have 1,100 subscribers you have $33,000, and if you deduct $6,600 from that, that being the interest on your investment, deducting that from $33,000, which is the income from 1,100 subscribers, the $6,600 representing the interest on the money which you are supposed to have borrowed or to be paying dividends upon, that leaves $26,600. The difference between 500 subscribers at $30 and 1,100 subscribers at $30, is $18,200 a year. Do you think the whole of that would be eaten up in paying the extra expense of taking care of the additional 600 subscribers over and above the 500? A. You are at one end of the question and I am on the other end of it. The point I make is this, you are charging me interest on $110,000 for 500 subscribers.

Q. Well, that is the very point I make. A. No, I don't understand it in that way. I mean that I would rather have 500 subscribers at a cost of a hundred dollars a station, at the rate of $30 a year, than to have a thousand subscribers at a hundred thousand dollars cost. I say your profits would be greater in proportion to the money invested than if you had a greater number, and so you will find it as you increase. If you spend $200,000 on a plant and have 2,000 subscrib-

1740 ers, I say your profits will be less—

Mr. WORTHINGTON: Less than they would with a hundred thousand dollar investment and a thousand subscribers? A. Yes, sir. I don't think any man with common sense would go ahead and put up a plant at a cost of a hundred thousand dollars to accommodate 500 stations, at a thirty dollar rate. We find that the money is in the small plant, with these low rates that we are getting. In other words, we have 200 subscribers in Portsmouth. That pays us a better

dividend for the money invested than the thousand subscribers pay us over here. That is the point I am trying to explain to you. For instance, let me explain this in one way. For 500 subscribers I can give good service with 9 operators. With 1,300 subscribers we are using 27 operators. You see how it increases.

Q. Well, just let us get at that. For 500 subscribers you would have nine operators? A. Yes, sir.

Q. And their wages are $20 a month each? A. Yes, sir.

Q. That is $180 a month? A. Yes, sir.

Q. And then for 26 operators, that would be $520 a month? A. Yes, sir; about that. Now you want to figure out your maintenance account.

1741 Q. We are talking about this operating room. That is what we are after now. There is a difference of $240 a month, or an increased annual expense for the operating room of $2,680, but the increase in the receipts would be $13,000. A. You are just taking it in one department.

Q. I am taking that particular department because you specified that as the only thing that increased.

Mr. WORTHINGTON: I object to that because the witness specified that not as the only thing, but as one of the things which would result in increased cost.

By Mr. HEMPHILL:

Q. Does the same proportion go through all the others? For instance, suppose you have 500 subscribers, how many maintenance people would you have? A. One man can attend to all instruments and line-work on 500 stations.

Q. Have you ever had that explained? A. We now have five men in our maintenance department.

Q. Well, what is their cost? A. They average, say, $2 a day to a maintenance man?

Q. That is $600 a year? A. Yes, sir.

Q. How is it that one man can care for 500 subscribers and it takes five men to care for a thousand? A. That is on the same plan as the operators, where one man can attend to 500 stations, it will take five men to take care of a thousand stations. Troubles multiply. We have so many more

1742 troubles in proportion.

Q. You have only double the number of 'phones to take care of, have you?

Mr. WORTHINGTON: I must object not only to asking leading questions, but insisting on trying to force your witness to testify to what he does not want to testify to. I think it is about time for me to say that I ought to object to this and insist that it shall stop, and refer the matter to the court if

it is to go on. You must remember that this is your witness, and you have no right to even ask him leading questions. You have been doing it right along for an hour.

By Mr. HEMPHILL:

Q. Now what I started to ask you was this: If you have a plant for 3,000 subscribers or any other large number, is it cheaper to have that full number filled out and in operation, or is it cheaper to run it for a less number? A. I can say a less number, Mr. Hemphill.

Q. That if you have 3,000— A. We are speaking of a $30 rate?

Q. Yes. A. Yes, sir.

Q. That is, if you have a plant for 3,000 subscribers, what, according to your theory then is the very smallest number that is the most profitable? A. At the $30 rate?

Q. Yes. A. Well, I would not consider any plant that had over five or six hundred subscribers could be built and
1743 operated profitably at a $30 rate.

Q. That is a mere judgment of your own? A. That is just my judgment.

Q. You never had any experience in any other company? A. Not with 3,000 subscribers, no, sir.

Q. Suppose we had a plant for 3,000 subscribers, do you think it is better to have 500 subscribers at $30 than to have 3,000 at $30? A. Why, do you mean with your plan all completed and paid for?

Q. Yes, that is what I am talking about, a completed plant paid for, for 3,000 subscribers. A. If you want my opinion frankly, I think it would be best for a fellow not to have the plant at all. If he has got the plant completed and a $30 rate for 3,000 subscribers, he is bound to go into bankruptcy. He can not do it. I should think the fellow would be better off without the exchange.

Recross examination:

By Mr. WORTHINGTON:

Q. Has this company paid any dividends since its formation? A. No, sir.

Q. How many subscribers did the company have when you first became connected with it? A. 581.

1744 Q. I wish you would enumerate the various toll lines which the company has which are outside of the exchanges, the service for which is given to your subscribers at the $30 rate. A. Without extra charge?

Q. I want those outside, those for which you make an extra charge? A. A toll line between Norfolk and Old Point,

Hampton and Newport News; a toll line between Norfolk and Smithfield, and a toll line between Suffolk and Franklin and intermediate points.

Q. Are those all? A. Yes, sir.

Q. What is the total length of these various toll lines? A. It requires 18 miles of pole lines and two miles and a half of submarine cable for connections with the above named points.

Q. In keeping your books do you know whether the accounts relating to these matters are kept separate and distinct from the local exchanges here. A. The accounts are kept separate and distinct.

Mr. HEMPHILL: Mr. Pannill wishes it to appear that he was subpoenaed by the court and testifies under the order of the court.

Mr. WORTHINGTON: Suppose you let me ask him some questions which will bring that out.

1745 By Mr. WORTHINGTON:

Q. Are you testifying here voluntarily or under a subpoena out of the United States court? A. Under a subpoena out of the United States court.

Q. Issued at the request of Mr. Hemphill? A. Yes, sir.

Q. Did you appear before the judge and ask him not to issue the subpoena? A. I showed the judge a letter which I showed to Mr. Hemphill. Mr. Hemphill can answer that question.

Mr. HEMPHILL: What he did really was to show the letter of the president of the company directing him not to testify unless ordered.

Mr. WORTHINGTON: That being admitted, did you after the order had been made communicate with Mr. Fink, the president of the company, by telephone, in Baltimore? A. Yes, sir.

Q. And what instruction did you receive from him? A. He told me not to testify unless I was threatened with being put in jail, and rather than go to jail I would be compelled to testify.

WILLIAM PANNILL,
By the Examiner by Consent.

Subscribed and sworn to before me this —— day of ——— A. D. 1899.

Special Examiner.

1746 C. FREDERICK BONNEY, a witness of lawful age, being called on behalf of the complainants, after being by me first duly sworn according to law, deposes and says as follows:

Direct examination.

By Mr. HEMPHILL:

Q. Mr. Bonney, what is your age, residence and occupation? A. I am 28 years old, and live at 310 West Island Avenue, Norfolk. I am bookkeeper and cashier of the Southern States Telephone Company.

Q. State whether your duties enable you to speak of the receipts and expenditures of the company? A. Yes, sir; I think they do.

Q. What are the rates of your company in this city? A. $25, $30 and $10; $25 for residences, $30 for business, and $10 each for extension sets, additional instruments.

Mr. WORTHINGTON: Like that one on the desk there? A. Yes, sir.

By Mr. HEMPHILL:

Q. What do you average per annum on these receipts?

Mr. WORTHINGTON: Are you asking for the gross receipts?

Mr. HEMPHILL: No, the net receipts per annum, if you can tell.

1747 Mr. WORTHINGTON: I object to that unless the witness knows of his own personal knowledge and without referring to the books, on the ground that the books are the best evidence and should be produced.

By Mr. HEMPHILL:

Q. Of your own knowledge do you know what the receipts are? A. Our receipts will average from rentals alone $30,000 per annum. This is based on the present number of subscribers that we have.

Q. That is the total receipts you mean? A. No, sir. That is from rentals alone. We receive about $2,500 to $3,000 on tolls for a connection made out of town.

Q. What are your annual expenses, what were they last year?

Mr. WORTHINGTON: I repeat the objection that I have just made.

By Mr. HEMPHILL:

Q. Do you know of your own knoweldge or only from what the books show? A. I know from my own knowledge and the

books too. I remember what the books show and it would be a safe estimate that our actual expenses last year were $22,000. That is expenses alone, but that year we had about $3,000 of unusual expense, and I should not think this year there would be more than $20,000.

1748 Q. Do you mean that this year you had unusual expenses? A. No, last year.

Q. What were the unusual expenses? A. We had a damage to our cable at Old Point which cost us $1,200. We had damages to the cable in the harbor here on several occasions that cost us nearly a thousand dollars.

Q. What were your receipts last year from all sources? If you can't tell that you can produce the books. A. I will have to refer to the books just for a moment.

Witness leaves the room and returns.

A. Our entire receipts from tolls and rentals amounted to $26,677, to be exact.

Q. And the expenses were $22,000? A. Yes, sir.

Q. What is the bonded debt of the company? A. $45,000.

Q. What rate of interest is it bearing? A. Well, whatever the market is. Sometimes it is four per cent and sometimes it is five. At present it is five per cent.

Q. Do you mean the bonds have been sold yet and issued to the public? A. No, sir; not issued to the public. They are held by the Fidelity & Deposit Company, of Baltimore.

Q. You borrow the money and put those up as security; is that it? A. Yes, sir; and they charge us the market

1749 rate of interest.

Q. What is the capital stock of the company? A. The capital is $200,000.

Q. Can you tell the total cost of maintenance during the year 1898? A. The maintenance was $6,356.

Q. What is included in that? Does that mean the maintenance gang outside only? A. Well, and for the material that they use in repairing lines.

Q. What were the total maintenance and operating expenses, including the operating of the switchboard and the salaries of officers?

Witness makes a computation.

A. There is another item I have under my expense account, salaries of officers and sundry expenses, all embodied in one, but I have separated it on a memorandum from my annual report. Do you want to see that?

Q. Yes. A. I have them all separated.

Witness again leaves the room, and on returning says:

The salaries for the officers of the company amounted to $1,725. That does not include the superintendent. That was

just for the president, vice president and the secretary and treasurer. I can add the salary of the superintendent and my own salary. The salaries of the president, vice president and secretary and treasurer amounted to $1,725, and for Mr.
1750 Pannill, myself and the others in the office, the collector, etc., they amounted to $2,493.

Q Does the $2,493 include the $1,725? A. No. the two together would amount to $4,218.

Q. The total salaries of the general officers here amount to $4,218. A. Yes, sir.

Q. And the maintenance how much? A. $6,356.

Q. What are the expenses of the operating room? A. The operating room last year was $7,078.

Q. Are those all the items outside of construction? A. Well, the general expense account, such as taxes, insurance and printing.

Q. What did the taxes amount to? A. The taxes and license were $1,902.

Q. The printing, etc.? A. I haven't it all on here. This is just a letter that I wrote Mr. Fink detailing some of the items. I can give you the others in just a moment. The other sundry expenses were $2,562.

Q. That is a total of $22,216. A. Yes, sir.

Q. Is there another telephone company here? A. I suppose we can call it a pretty good one—the Southern Bell Telephone Company.

Q. How long has it been in operation? A. That I
1751 could not tell you.

Q. Was it here when this one commenced or not? A. Yes, sir.

Q. Had it been here some years before that? A. Yes, sir.

Q. What rate did they charge before you began business? A. They charged $60 a year for the business 'phones and $40 for the residence 'phones.

Q. What do they charge now? A. $30 for the business 'phones and $18 for the residence 'phones.

Q. Do you know how many subscribers they have? A. No, I do not.

Q. Is there another company here doing a long distance telephone business? A. A charter was granted to such company, but I understand they are the same as the Bell. The manager—

MR. WORTHINGTON: I object to what the witness understands.

By Mr. HEMPHILL:

Q. What fact were you going to state? A. The Bell Company and the long distance people have an office together.

That is, one manager attends to both companies' business.

Q. State whether they are in the same building or in different buildings? A. In the same building, sir.

1752 Q. State whether your business is decreasing or increasing in the number of 'phones. A. Our business is on the increase.

Cross examination.

By Mr. WORTHINGTON:

Q. Does the sum of $26,677 which you have given us as receipts last year from all sources include the receipts from the toll lines? A. Yes, sir.

Q. Can you give us your receipts from the local exchanges alone from rentals? A. Yes, sir.

Q. What did they amount to? A. I would prefer to look at the books to find out exactly.

Q. I wish you to look at the books. A. The receipts last year from rentals alone were $23,230. Our tolls, $1,441.

Q. Now these expenses which you have given us, amounting in all to $22,216, are those expenses on account of the whole business or only the telephone exchange? A. That is all the exchanges together, Berkeley and Portsmouth.

Q. It does not include toll line expenses? A. Yes, sir; toll lines and everything.

1753 Q. What part of those expenses are chargeable to toll lines? Can you separate that? A. Yes, sir. (After consulting the books.) The expenses of our Old Point line were $2,015.

Q. A toll line? A. Yes, sir; our expenses on that toll line, that is on account of the destruction of the cable. We have to replace it.

Q. You deduct that from the general expenses you have given us of $22,216, to get at the actual expenses of this exchange? A. Yes, sir.

Q. How much is that? A. $2,015, expenses of the Old Point line.

Q. Is there any other toll line than that? A. There is one at Norfolk, $31. The whole expense of toll lines was $2,046.

Q. That would make the expenses of the telephone exchanges $20,170. A. Yes, sir.

Q. How much during the year did you expend for construction? A. That is another item. I will have to refer back, for I cannot bear these things in mind.

Q. You had better bring your books in here, because there are lots of things we want to know about.

Witness produces the company books, and says:

You want to know how much we spent during the year for construction?

1754 Q. Yes. A. $4,467. I keep the construction and equipment account separate. The two represent the same thing, that is, additional plants; $4,467, that is just for labor alone.

Q. The construction expenses for labor is $4,467? A. That is just the labor for putting in instruments and building lines.

Q. That is the labor alone? A. Yes, sir. Now material would come under the head of equipment.

Q. How much was that for last year? A. Our equipment account was $8,546, and construction $4,467, as I gave you before.

Q. During that year did the company put down any underground conduits? A. Yes.

Q. How much, and how much did they cost? A. You mean complete with cables and all?

Q. Yes. A. It cost $970.

Q. Did the company erect any new main pole lines during the year? A. We put up the aerial cable. We did not put up any new lines. Mr. Pannill knows about all the work that was done.

Q. Did the company during the year receive any money from any source except from telephone rentals and from toll charges

1755 —I mean by borrowing money or selling bonds, or stockholders paying up their subscriptions, or anything else whatever except telephone rentals and toll charges? A. We borrowed some money, which was chiefly repaid. It was borrowed during the year and repaid during the year. That is, some of it was repaid and some of it was not repaid during that year.

Q. How much did they borrow during the year and how much of that remains unpaid? A. We borrowed $9,800.

Q. How much of that has been repaid? A. Well, all of it has been repaid now. But during the year there was only $500 repaid.

Q. Where did they get the money to repay the other $9,300 this year? A. Stock was sold for the purpose. We had $50,000 of stock.

Q. Sold when? A. Sold in December.

Q. To what extent? Sold how much stock? A. $50,000.

Q. $50,000 par value? A. Yes, sir.

Q. What did you get for it? A. I don't know.

Q. Don't your books show what your receipts from it were? A. No, sir; because that was kept by the treasury in Baltimore.

Q. Who purchased that stock? A. I don't know that,
1756 either, for he has those records.

Q. Then so far as your books show the indebtedness remains? It has never been entered on the books? A. That is the idea. I know it has been sold, but I have not the record of it. I know the indebtedness has been cancelled.

Q. Prior to December did the company have only $150,000 of capital stock? I understood you to say in reply to a question of Mr. Hemphill that the capital stock of the company is $200,000. A. Yes, sir.

Q. Does that include the $50,000? A. The stock had not been issued, but was held in reserve as treasury stock.

Q. You sold $50,000 of treasury stock? A. Yes, sir.

Q. Is there any treasury stock remaining, or is it all out now? A. It is all out now.

Q. Whose business is it in your company to designate what items shall go to construction account and what items shall go to maintenance account? A. The superintendent.

Q. Mr. Pannill? A. Yes, sir.

Q. You in keeping your books follow his instructions in that matter? A. Yes, sir.

1757 Q. When a telephone and appurtenances are installed in a new subscriber's office, do you know to what account the new expense is charged? A. Yes, sir.

Q. To what account? A. Charged to construction account, that is, when a new installation, a new instrument is put in for a new subscriber.

Q. To what account is the expense charged of putting up the wire and connecting the new subscriber's house or office with the company's main line. Is that charged to construction too? A. Yes, sir.

Q. What are the principal items of material purchase that enter into the sum of $8,546 which you have charged to material during the year 1898—which you have charged to equipment? A. A lot of aerial cable, underground cable and wire; iron and insulated wire and instruments.

Q. Has the company at any time made any appraisement of its assets, giving the value of the different articles of property which it owned at the time of the appraisement? A. Have they had any appraisement?

Q. Yes, has anything of that kind been done? A. No, sir; not to my knowledge.

Q. Do you have on your books any depreciation account? A. No, sir; we have a maintenance account.

1758 Q. I understand then that you charge certain items of expense to maintenance, but I ask whether you have anything in the nature of a reserve set aside for depreciations? A. No sir.

Q. No account of anything of that kind appears in your books? A. No, sir.

Q. How long have you been connected with the company as cashier? A. 21 months.

Q. How many subscribers did the company have when you first went into its employ? A. I think about 890.

Q. Have you had sufficient opportunity to tell us whether or not as the number of subscribers increases the expenses and line troubles and so on increase in the same or larger proportion as the number of subscribers increase? A. That I don't know.

Q. Do you have anything to do with the operating room or management of the switchboard? A. No, sir.

Q. The company has never paid any dividends? A. No, sir.

Q. What is its total indebtedness now, bonded and floating? A. Do you mean right up to date or up to the 1st of January?

Q. At the present time. First, if you have it conveniently, what was its indebtedness on the 1st of January, 1899, and give the items? A. On the 1st of January—our fiscal
1759 year closes on the 30th of November. The other information I have given you has been based on our annual statement on the close of last year's business.

Q. Did you say the 30th of November or the 31st of December? A. The 30th of November. You want everything, bonded indebtedness and all, do you not?

Q. Yes, I would like to have the items too. A. Our indebtedness on the 30th of November was $69,022.

Q. How was that made up? A. $64,215 was for cash loans. That is included in the bonded indebtedness, etc., and there was $2,807 due for material. That is all.

Q. Are the salaries and wages due officers and employes paid up to date? A. Yes, sir.

Q. Is the interest on the bonded debt kept paid up? A. Yes, sir; paid every quarter.

Q. The Southern Bell Telephone Company in Norfolk does not have any metallic circuit, does it? A. That I don't know, sir.

Q. How many subscribers did this company have one year ago? A. I could not say that without referring to the books.

Q. Well, if it would not be too much trouple suppose you do that. A. One year ago we had 1,027 subscribers.
1760 Q. And to-day you have how many? A. 1,300.

Q. Referring to your underground system here, are there any asphalt pavements or other sheet pavements in Norfolk? A. No, sir.

Q. What kind of pavements have the streets upon which the underground conduits here were laid? A. I am not thor-

oughly familiar with the streets that our underground conduits go through. Most of the underground work was done before I came here.

Redirect examination.

By Mr. HEMPHILL:

Q. Have the bonds of the company been sold, or are they simply lodged as collaterals to the debt? A. They have been sold.

Q. Does your company have metallic circuits? A. Yes, sir.

Q. Is it all metallic? A. Yes, sir.

C. FREDERICK BONNEY,
By the Examiner by Consent.

Subscriber and sworn to before me this —— day of ——— A. D. 1899.

Special Examiner.

1761 WILLIAM PANNILL recalled for further cross-examination.

By Mr. WORTHINGTON:

Q. Did the company during the year 1898 put up any new pole lines? A. No sir.

Q. Can you tell us what was the character of pavement upon the streets in Norfolk under which you laid your underground conduits? A. Belgian block.

Q. All Belgian block? A. Yes, sir; with the exception of probably 200 or 300 feet.

WILLIAM PANNILL,
By the Examiner by Consent.

Subscribed and sworn to before me this —— day of——— A. D. 1899.

Special Examiner.

1762 WASHINGTON, D. C., *April 5th*, 1899, 3.30 o'clock P. M.

Met pursuant to agreement at the office of Birney & Woodard, Mertz Building, Washington, D. C.

Present on behalf of the complainants, Mr. BIRNEY and Mr. HEMPHILL.

Present on behalf of the defendant, Mr. WILSON and Mr. WORTHINGTON.

WILLIAM L. ELTERICH, a witness of lawful age, called by and on behalf of the complainants, having been first duly sworn, is examined.

By Mr. BIRNEY:

Q. Please state your name, age and occupation. A. William L. Elterich, attorney-at-law. I am fifty-nine years old.

Q. Of what country are you a native? O. Of Bavaria, Germany.

Q. At what age did you leave Germany? A. When I was thirty years old.

Q. Have you been in the United States since that time? A. Since that time.

Q. And have familiarized yourself with the English language? A. I have done my best.

1763 Q. What experience have you had in making translations of the German language? A. I have had practice in making translations.

Q. You are familiar with the German language? A. I think so.

Q. You read and write it freely? A. Yes, sir.

Q. Do you also read and write English? A. I do.

Q. Have you, at my request, examined an exhibit in this case marked Clauson No. 1, and translated an article in that document entitled "New York Telephone Company?" A. I have done so.

Q. Look at the paper I now show you, and say whether that is your translation of the article referred to, and whether it is accurate. A. Yes; I read it over and found it exactly what I had in my manuscript, in translating it.

Q. This is a typewritten copy of your manuscript? A. Yes; this is a typewritten copy of my manuscript.

Q. Did you translate this article into your own manuscript? A. Yes; I wrote it, and this is a true copy of that. I have read it over and found it to be correct.

Q. I now show you another paper, being a table in manuscript. Please state if you prepared that, and if it is in your handwriting. A. Yes; I prepared that, and it is in my handwriting.

1764 Q. Is that a translation of Table 3 in the article Clausen No. 1, which you have already referred to? A. Yes, sir.

WILLIAM L. ELTERICH,
By the Examiner by Consent.

Mr. BIRNEY: We now offer in evidence the article heretofore marked for identification "Clausen No. 1," and the translations referred to by the witness. (The translation of the article entitled "New York Telephone Company" is filed herewith, marked "Exhibit Elterich, No. 1," and the translation of Table 3 is filed herewith, marked "Exhibit Elterich No. 2.")

Mr. WORTHINGTON: Besides the objection to all testimony relating to telephone matters in other cities, we object specially to these exhibits because, without information as to the condition under which the exchanges referred to in these exhibits were operated, and without some proof as to the authenticity or reliability of the tables, they are not competent evidence, even if it be competent in general to go into the details of the work of telephone exchanges in othr cities than Washington.

Mr. BIRNEY: Counsel for complainants here offer in evidence the report of the Citizens' Telephone Company of Grand Rapids, Michigan, to the Auditor-General of the State of Michigan, referred to in the testimony of the witness Ware, which, by agreement of counsel, was thereafter to be produced, being for the year 1898.

(Said report is filed herewith, marked "Exhibit Ware A.")

1765 Counsel for the complainants also produce and hand to counsel for defendant a similar report made for first Monday of July, 1897.

(Said report is marked for identification "Exhibit Ware 2.")

Counsel for complainants produce and file with the Examiner official documents marked "Senate Document No. 39, 55th Congress, 2d Session, entitled "Information furnished through the State Department by diplomatic and Consular officers of the United States, in response to Senate Resolution of July 12, 1897, offered by Senator Butler of North Carolina," bearing the stamp "Washington; Government Printing Office, 1898," and offer in evidence those parts of that document referring to telephones in foreign countries as follows:

From pages 115 to 117, inclusive, being in two parts, the first part entitled "Telephone Exchange and private wire regulations. Part 1.—Telephone exchanges," the second part being entitled "Part II.—Private wires."

Also the report of Andrew D. White, United States Minister to Germany, found on pages 132, to the first half of 135, inclusive, so far as the same refers to telephones.

Also that part of the same document found on pages 168, 169, so much as appears on pages 170 and 171 in relation to telephones, and which is embraced within pencil lines, so much as appears on pages 173, 174 and 185 in relation to telephones, the same referring to the Empire of Japan.

Also that part of the same document referring to Spain found on pages 203, 204, 205 and 207, which relates to telephones.

Also that part of the same document referring to
1766 Spain on pages 203, 204, 205, 206 and 207, which relates to telephones.

Also so much of the said document as contains reports of the Minister to Sweden and Norway to the Secretary of State, found on pages 240 to 248, so far as the same refer to telephones.

Mr. WORTHINGTON: Besides the general objection to all testimony relating to telephone rates in other cities and in other countries, counsel for the defendant specially object to each of the several parts of the Senate document offered in evidence, for the reason that it is hearsay testimony given by unsworn witnesses, whom the defendant's counsel has had no opportunity to cross-examine; and for the further reason that in no case does it show what kind of service is rendered for the rates charged, nor whether the business is done at a profit or at a loss; and counsel for the defendant give notice that they will move the Court to strike out all the extracts from this Senate document, on the grounds above set fortth.

Having examined the paper just marked for identification "Exhibit Ware B," counsel for the defendant state that they do not care to have the whole of it offered in evidence, but that they do wish to have go in evidence the following parts of it: Under the heading "The number of poles and the number of miles of wire used for each telephone exchange
1767 or line" is given, as in "Exhibit Ware A," the number and dimensions of the poles and a description of the different kinds and quantities of wire in use, and to this table are appended the following notes:

"B. A ten per cent. discount on poles should be made, being annual depreciation.

"C. Annual depreciation on wire probably ten per cent."

Also the table headed property owned, leased or used by the company not enumerated above," which is as follows:

1768

Classification.	Number or quantity.	Cost of all of each class.	Deductions for age, wear or damage.	Remarks.
Cross-Arms	6692	1950.	450.00	& present market prices.
Insulators	63000	756.	75.60	10 per cent.
Batteries	120	26.40	400.	66⅔ per cent. nearly worn out.
Battery materials	600	42.	14.40	10 per cent.
Tools		600.	200.	33⅓ per cent. market prices.
Switchboards		5610.		
Knobs	32000	144.	7.08	10 per cent.
Pins	50023	600.		
Zines	600	12.		
Brackets	59 0	70.82		
Steel pins	1500	67.50		

Testimony on behalf of the complainants was thereupon announced closed.

1773 In the Supreme Court of the District of Columbia.

JAMES F. MANNING *et al.*,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY. } No. 19,558. In Equity.

Defendant's Testimony in Rebuttal.

Montreal, Canada, June 2nd, 1899, 2 o'clock p. m.

Met pursuant to agreement at the office of the Bell Telephone Company of Canada, Montreal, Canada.

Present on behalf of the complainants, Mr. Birney.

Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

Lewis Brown McFarlane, a witness of lawful age, called by and on behalf of the defendant, in rebuttal, having been first duly sworn, is examined

By Mr. WORTHINGTON:

Q. Where do you reside? A. In the town of Westmount.

Q. Where is that? A. Adjacent to the city of Montreal. It is one of the suburbs of Montreal.

Q. What is your age, Mr. McFarlane? A. Forty-

1774 seven.

Q. What is your occupation at present? A. General superintendent of the Bell Telephone Company of Canada.

Q. How long have you held that position? A. Since June, 1896.

Q. Prior to that, what was your occupation? A. I was manager of the Eastern Department of the Bell Telephone Company of Canada, from August, 1880, up to that time.

Q. Have you had any experience in telephone matters except in those two offices? A. Prior to that I was superintend-

ent of the telephone department of the Dominion Telegraph Company of Canada.

Q. For how long? A. For about one year or a little longer; from 1879 to 1880.

Q. What territory is covered by the operatings of the Bell Telephone Company of Canada? A. From the Rocky Mountains eastward to the eastern limits of the Province of Quebec we operate exchanges and agencies and long distance lines.

Q. On the south your territory is bounded by the United States? A. By the United States.

Q. And on the north by business, I suppose? A. The limits of the business; and on the eastward by New Brunswick.

Q. What is the business of the Bell Telephone Company of Canada? A. Their principal business is operating tele-
1775 phone exchanges and long distance lines. We also do something of a general electrical business, such as installing, selling and operating fire alarm patents and other electrical apparatus.

Q. To what extent, if at all, has the Bell Telephone Company of Canada in the past manufactured telephone and telegraph apparatus? A. Until recently they have had a factory of their own and manufactured their own telephonic apparatus, including their telephones, switchboards and apparatus of that description used in the telephone business.

Q. How many telephone exchanges does the company operate? A. The company owns and operates three hundred and forty-three exchanges and three hundred and forty agencies.

Q. What are the largest cities? A. Montreal, Toronto, Quebec, Winnipeg (Manitoba), London, Hamilton. In fact, exchanges are operated in all the principal cities and towns and villages in the Provinces of Quebec, Ontario and Manitoba, and some in the Northwest territories also.

Q. How are the agencies distinguished from the exchanges? What is the difference? A. An agency is an office, sometimes known as a toll-station, where the business is practically altogether long distance business, where they have no local telephone exchange service.

Q. To what extent are you familiar with the general
1776 construction and operation of all the exchanges in the territory of your company? A. I have had experience in that line since 1879. At the time the Dominion Telegraph Company had the telephone business in operation they opened, under my supervision, exchanges in a large number of cities and towns in Canada; and since I entered the service of the Bell Telephone Company of Canada I have had oversight of the general work of construction and operation, part of the time in the eastern part of Ontario, in all of the Province of

Quebec, in the Maritime Provinces, and latterly over the whole territory.

Q. You are aware of the fact that in the city of Toronto this company has done business for a number of years under an agreement entered into with the authorities, which limited the rates which they were to receive? A. There was an agreement with the city of Toronto, which expired in 1897, I think. It was for the period of five years, and limited the rates which we could charge to subscribers; and it gave the city a percentage of the gross earnings of the company.

Q. What were the rates fixed by the agreement? Just state them. A. $45 for places of business and $25 for residences within the corporate limits of the city of Toronto, for Blake service.

Q. Has that agreement been renewed? A. It has not.

Q. It is not in force now? A. It is not in force at present. It has expired.

1777 Q. To what extent are you familiar with the construction of that plant in Toronto? What opportunities have you had to observe it? A. I have made frequent visits to it, going over the plant, both inside, in the buildings of the company, and outside. I have a pretty thorough knowledge of the condition of the plant and what it consists of.

Q. What proportion of that plant is overhead and what underground? A. Making an estimate of each subscriber's line, I would say that one-third of the subscriber's line is underground and two-thirds overhead.

Q. That is, averaging? A. That is an average. In other words, there is barely five miles of conduit in use in Toronto.

Q. How many subscribers? A. On the 31st of December last there were 5,932 subscribers.

Q. It does not vary materially now, I presume? A. Simply the normal growth, which does not amount to very much. I do not know the exact numbers.

Q. As to the overhead plant in Toronto: What kind of poles are in use, and of what dimensions are they? A. Cedar poles. The dimensions would be about 7 to 7½ inches at the small end, and running from 33 feet to 55 feet in length.

Q. Have you any objection to telling us what those poles cost? A.

1778 They average, for poles of 40 feet or less, about $10, standing, and for those above 40, from 40 to 55 feet, about $15, standing.

Q. Does that mean just the pole put in the ground, ready for the cross-arms, or does it mean equipped with cross-arms? A. That is without the cross-arms. We figure that each cross-arm, equipped on the pole, will cost us from $1.17 to $1.20.

Q. Equipped? A. Ready to receive the wire.

Q. Would that include the insulators? A. That includes the insulators, ready to receive the wire—with one row of insulators on top.

Q. On top of each cross-arm? A. On top of each cross-arm.

Q. What kind of insulators do you use? A. For one side of the subscriber's line we use what is known as pony glass insulators. For the return side, we use porcelain insulators, which are attached to the under side of the arm.

Q. Your cross-arms, then, carry wires on top and on the bottom both? A. Yes, sir; they carry twenty wires.

Q. What is the cost of the glass insulators that they use for the top wires? A. About 1¼ to 1½ cents each.

1779 Q. What is the cost of the porcelain insulators that you use on the lower side of the cross-arms? A. With the screw, about 1¼ cents.

Q. What kind of cable poles do you have in your Toronto plant? A. The cable poles are practically the same as others, except that they may be a little stouter; but the same description of cross-arms, except that they are doubled, and the terminal box is fastened on to the pole and the wires distributed to those cross-arms.

Q. What kind of wire do you use on your overhead construction? A. No. 12 iron wire.

Q. Exclusively? A. Exclusively, except for leading off wires. In the general run of wires along the streets it is No. 12 wire.

Q. As to your underground plant, what proportion of it is under asphalt pavement, if any? A. When it was laid there was no asphalt pavement. The asphalt pavement has been put down since—what there is of it.

Q. Under what kind of pavement did you lay your conduit? A. A great deal of it was macadam; some of it was cedar block —what is known as wood pavement—and a little, I think, was laid under cobblestones. I am not quite positive about the quantity.

1780 Q. What kind of covers do you use on your manholes? A. We use a single iron cover.

Q. What does a cover cost? A. The cover placed on the manholes, with the casting, costs $21.25.

Q. Where do you run your overhead wires? Do you run them down the streets, the alleys, or over houses, or how, in Toronto? A. In Toronto we run them on the highways and in the public lanes, our charter giving us the right to do so under the supervision of an officer whom the city is required to appoint.

Q. Since the agreement between your company and the city of Toronto, of which you have spoken, has expired, does the

company pay any percentage of its earnings, either net or gross, to the city as taxes at all? A. It pays no percentage of its earnings. The only taxes we pay are the regular taxes which are assessed by the city in the usual way.

Q. Do you know about what they amount to annually now? A. They were about from $2,100 to $2,200 last year.

Q. Have you anything to do with keeping the accounts of the Toronto business? A. No, sir, I have not. That is in the hands of the secretary treasurer.

Q. I wish you would describe the manner in which the work of installing a new telephone in a subscriber's office or place of business in Toronto has been done, so that we may
1781 see the character and style of the work. A. The bulk of the work in Toronto was done in about 1892 or 1893, when there was a general reconstruction. At that time it was our practice to install the subscriber's telephone by running double patent-finished annunciator wire from the subscriber's telephone to the window and there connecting it with a fuse wire arrestor. Insulated wire was run through a 2½ inch tube to the outside, and ordinarily the iron wire is carried from that point to the exchange. Where there were trees or other obstructions, a double wire from the subscriber's window was insulated to the pole, and from the pole to the central exchange one side of the line was carried on the glass insulators on the upper portion of the cross-arm, and the other wire attached to porcelain insulators on the lower side of the corresponding cross-arm to the point where the overhead lines terminated, where it connected with the underground cable. That is the usual type.

Q. What is this fuse you speak of? A. It is a No. 40 brass wire, supported on a porcelain base, and covered with a hard wood cap.

Q. What is the function of that apparatus? A. To protect the wires and instruments in the building from the entrance of abnormal currents which may arise from trolley or electric light crosses or lightning, the object being to protect the apparatus from injury.

Q. What does it cost? A. For a subscriber's station we figure they cost 13½ cents per station.

1782 Q. How many cross-arms, each carrying twenty wires, do you have on your poles? A. According to the location, they run from 1 to —I think we have some with as many as 12 or 13 cross-arms.

Q. Are you acquainted with the plant of the Chesapeake & Potomac Telephone Company, in Washington? A. Yes, sir; I have some knowledge of it.

Q. Have you recently made an examination of it? A. Yes,

sir; I have done so at the request of the president of the Chesapeake & Potomac Telephone Company, Judge J. M. Wilson.

Q. I wish you would state, in a general way, how thorough that examination was, and if anybody assisted you in pointing out the lines, and who it was. A. I met Mr. Crenshaw, the superintendent of construction of the Chesapeake & Potomac Telephone Company, and with him I first examined the terminals of the underground cables entering the main exchange building, on 14th and G streets, including the distributing rack and the appurtenances in that room. I then examined the underground work in various manholes in the central portion of the city, and afterwards went over a large portion of the aerial work throughout the city and in the neighborhood thereof. I then, with Mr. Crandall, visited the exchange of the company, on 14th street, and examined the switchboard, intermediate rack, and other apparatus in the operating room, and afterwards, with one of the inspectors, a number of subscribers' stations. I also took occasion to visit other stations
1783 alone. Besides that, I might say I have been in Washington before, and have some little knowledge of the plant, having seen it on other occasions.

Q. I wish you would describe the poles you found in use in the Washington plant. A. The poles I found were of chestnut. The larger portion of them appeared from the ground to be 8 inches or over at the small end, and none of them, except in the outskirts of the city, appeared to be less than 60 feet in height. Quite a number appeared to be 65 and 70 feet in height. They were stout, strong poles, and, taken altogether, were about the best sample of a lot of telephone poles that I have ever seen.

Q. How did you find those poles equipped as to cross-arms and insulators? A. I went to the stores department of the Chesapeake & Potomac Telephone Co. for the purpose of looking at the quality of the material they furnished, and there I saw a number of cross-arms, some in an unprepared state; that is, without paint, so that I could ascertain what quality of wood was used and what it looked like. I saw others painted. I saw the quality of copper wire they used and the quality of the iron fittings; and I must say, from what I saw, they were apparently the best for the purpose. I may say the same with regard to what were on the poles. I could not examine them closely from the ground, but the material in all respects appeared to be first class.

1784 Q. What kind of insulators do they use there? A. I do not know what the technical name is, but they are intermediate between the pony insulator and what is known as a large insulator or telegraph insulator. It is the kind of

insulators that are used by the American Telephone & Telegraph Co., and I think costs over two cents each.

Q. How many insulators and corresponding wires did the cross-arms carry? A. Ten wires, principally of No. 12 copper.

Q. That is, on the top of the cross-arms, or the bottom, or both? A. They were all on the top of the cross-arm, in the glass insulators.

Q. Did you find any case in which they carried wires on the lower side of the arm? A. I saw, in a few instances, two porcelain insulators with wires on the lower part of the cross-arm, and on calling attention to it I was informed that they were the wires of the Fire Alarm Department of the city of Washington, over which the company had no control; but outside of that, all their construction, as far as the insulators and cross-arms were concerned, was in very good shape. Ten wires were carried on each cross-arm, on the upper side.

Q. What seemed to be the maximum number of cross-arms to the pole, so far as you observed? A. There were two or perhaps three routes where there seemed to be ten or perhaps eleven cross-arms. They were what was known as the old construction, and I was informed they had not been changed on account of waiting for a permit to put the plant in that
1785 portion of the city underground.

Q. Without regard to what you were told, could you see, from the appearance of the lines, whether they were old or not? A. The only way I could tell was that the poles seemed more slender, and the fact that they were so heavily laden with wire made me think it old construction; but otherwise the work was well done. It was good work, I think.

Q. What kind of wire did you see carried on those poles; iron, copper or what kind? A. By far the larger portion seemed to be copper.

Q. Do you know the cost of that copper wire? A. About $20 per mile.

Q. How did you find the subscribers' stations equipped in Washington? Describe the construction there? A. The metallic circuit stations, in some cases, were equipped with solid back transmitters; others with Blake's. The wiring was of various kinds, but generally regular rubber covered wire, all having different kinds of rubber except the stations that were on what they called a single Blake circuit. Those wires were patent finished wires. The wires, as they left the building, were carried through in some cases a double tube, and in some cases a single tube, through the windows, each tube being about 10 inches in length.

Q. What is the length, by the way, of the corresponding tubes that you use in Toronto? A. 2½ inches. The wires were

brought through the window by means of special okonite wire to the outside, where they were fastened to a knob or
1786 insulator.

Q. Did you find any device used in Washington for the protection of the subscribers' apparatus from lightning? A. Inside the windows each wire was protected by an arrestor, which was mounted on a large porcelain frame. Those arrestors, I believe, are sold for a dollar each by the Western Electric Co.

Q. What is the cost of iron wire per mile such as you use in Toronto? A. About $5.80 per mile.

Q. As to the underground plant in Washington, how did you find that constructed? A. It is first class in every respect.

Q. What kind of covers do they use on their manholes there? A. They use a double cover; that is, two covers, the under one being laid on a gasket of rubber, in order to make the manhole air-tight, and to prevent the entrance of water or rubbish.

Q. Did you find in Washington any lightning arrestor or similar device in use at the exchange end of the subscribers' wires? A. Each subscriber's line is protected by the standard arrestor—apparatus devised for the purpose.

Q. I wish you would tell us whether, from the examination you made of the telephone plant of the Chesapeake & Potomac Telephone Company in Washington, you found anything that was in use there, either in the way of construction or operation, that was not necessary or could be done away with with-
1787 out injury to the service, in your judgment? A. After a careful examination of the plant, I could not see where anything could be done away with without detriment to the service. The operating staff, so far as I could see, was not too much for the work they had in hand. I should think any reduction in the staff would be detrimental to the service.

Q. What do you pay ordinary laborers that you have to use in your work at Toronto? A. The pay to laborers is practically $30 per month; that is, for the inferior class of labor. That is the maximum pay.

Q. What do you pay linemen? A. The average salary we paid linemen last year, including the foreman, in Toronto, was $43 per month.

Q. Did that include the foreman? A. That included the foreman; yes, sir.

Q. What do you pay inspectors? A. For the same year the instrument men and switchboard men, including the foreman, were paid $38 per month.

Q. What is the average pay of your operators at the switchboard? A. A small fraction over $20 per month. I can give it to you exactly for last year. It was an average of $20.25 per month for operators.

Q. About how many subscribers has the American Bell Telephone Co. of Canada, all told? A. The total number
1788 of sets of instruments earning rental on the 1st of January last was 32,082. Then, in addition to that, we have all the toll stations, that are earning revenue in a different way, making about 2,500 more—close on to 35,000 telephones.

Q. All this, I believe, is separate from the long distance business, is it? A. Not all that is separate; no, sir. That is the total number of instruments earning revenue in the business of the Bell Telephone Co. of Canada. 32,082 are under rental. The other 2,500 are earning revenue by tolls or some other means.

Q. How does the number of subscribers at each exchange run? State the maximum and the minimum. A. The minimum would be one. The maximum would be at Montreal, where we have over 7,000 subscribers.

Q. What opportunities have you had, from your superintendence of these various plants, to know what is the depreciation in them annually which must be reckoned on? A. We have had considerable experience in that, having to discard plant very frequently, many times before it had worn out.

Q. Why? A. Because of the improvements in apparatus; or the business would improve so rapidly that the apparatus in operation would not fulfill the functions that were required of it under the new conditions.

Q. From all these causes what have you found to be the rate which must be allowed for depreciation, either from
1789 wearing out or from required substitution of new appratus? A. From our experience, we figure that ten per cent depreciation per annum is not excessive. It would simply take care of the wear and tear.

Cross examination.

By Mr. BIRNEY:

Q. When and by what company was the business of telephone exchange service commenced in Canada? A. The first telephone exchange work in Canada was commenced by a Mr. Pell, father of the inventor of the Bell telephone, who appointed a general agent to exploit the telephone businss in Canada. About the same time Mr. Edison came to Canada and appointed one or more agents. Subsequently the Dominion Telegraph Co. procured the right to use the Bell telephone and its adjuncts, from Alexander Graham Bell, with the exception of the cities of Toronto, London and one or two other points, where local companies had been started by Alexander Melville Bell. About the same time the Montreal Telegraph Co. secured control of the Edison patents. This was about the

latter part of 1878, or the beginning of 1879. I was appointed superintendent of the Dominion Telephone Co. in 1879, and ordered to commence building exchanges in Canada, and I thereupon started exchanges in Halifax, St. John, Montreal, Quebec, Ottawa and numerous other places. About the same time the Montreal Telegraph Co. started exchanges in Mon-
treal and possibly one or two other points in the Prov-
1790 inces of Ontario and Quebec; and the Western Union
Telegraph Co., who had had assigned to them the Edison rights in the Provinces of Nova Scotia and New Brunswick, started a telephone exchange in St. John, New Brunswick, and the nucleus of one in Frederickton. This was the beginning of the business in Canada.

Q. As I understand it, the Bell Telephone Co. of Canada now practically controls the business in Canada. Is that right? A. No, sir; they do not.

Q. What other companies, if any, are engaged in similar service? A. Probably about forty, more or less.

Q. And where? A. In British Columbia there are four or five companies. There is a company in Manitoba—I do not know whether it is a company or a corporation—have a telephone plant at Carberry and in that vicinity. There is a telephone company in operation, called the Citizens' Telephone Co., of Rat Portage and Keewatin, Western Ontario. Do you want me to give the names of others?

Q. You might do so. A. There are probably ten others in the Province of Quebec besides the Bell Telephone Co. of Canada. In the Province of New Brunswick there is the New Brunswick Telephone Co. and several others. In the Province of Nova Scotia there are several telephone companies. There
is the Prince Edward Island Telephone Co. in the Prov-
1791 ince of Prince Edward Island, and one, if not two, com-
panies in Cape Breton, which forms a part of Nova Scotia.

Q. Are there any rival companies to the Bell Telephone Co. of Canada in any of the large cities? A. Yes, sir; in the city of Montreal there is a competing company.

Q How many telephones? A. I believe they claim to have 1,200 or more. Their directory would indicate that they have at least a thousand.

Q. What interest, if any, has the American Bell Telephone Co. in the Bell Telephone Co. of Canada? A. I do not know.

Q. Do you know that it has no interest? A. I cannot say for a fact that it has any interest. I have no access to the shareholders' books of this company.

Q. Are you not a shareholder yourself? A. No, sir.

Q. You have named several companies which commenced

the business of telephone service in Canada. Did the Bell Telephone Company of Canada acquire their rights; and if so, at what time? A. In the year 1880 and the year 1881 the Bell Telephone Co. of Canada acquired the rights of the Montreal Telegraph Co., the Dominion Telegraph Co., the Western Union Telegraph Company's interest in the maritime Provinces, and also one or two local companies in London, Ontario, Windsor, Ontario, and possibly one or two other places.

1792 Q. Do you know what was the capital stock of the Bell Telephone Co. of Canada? A. To-day?

Q. No; at the time of its organization. A. I can only give you that approximately. It was nineteen years ago.

Q. Give us your best information. A. Probably $250,000.

Q. What is its present capitalization? A. It is very close to $4,000,000 capital stock. As there has been some change in the quantity of stock issued, I cannot give the figures.

Q. Can you give me the amount of capital stock at the time of the time of the last annual report to that Company? A. The annual report has just been taken away.

Q. Who has just taken it away from you? A. The Secretary.

Mr. WORTHINGTON: I will state here, for the information of Mr. Birney, that the Secretary himself, who has much more accurate and personal information on these matters, will be called as a witness, and my friend can then learn all he wants to know about the stock of the Bell Telephone Co. of Canada if he thinks it of any importance.

By Mr. BIRNEY:

Q. Will you now please give me the names of, say, ten cities in Canada in which are the largest number of telephones in use under your Company's direction, of

1793 course, in each of them, as nearly as you can. A. I cannot give you that from memory, because with three hundred odd exchanges, I can hardly be expected to carry all the details.

Q. I ask you to give it as nearly as you can. If necessary, I will ask you to refer to your books. A. I would rather refer to the books and have it correct at once. Montreal, 7,260 subscribers; Toronto, 5,755; Quebec, 1,592; Ottawa, 1,508; Hamilton, 1,341; London, 1,124; Winnepeg, 1,093; Kingston, 510; Sherbrooke, 361; Brockville, 345.

Q. What is the character of the instruments, receivers and transmitters—telephone instruments, in short,—used in your service in Canada? A. The principal instruments in use for exchange service is the single pole Bell Telephone receivers, the Blake transmitters and the magnto-call bell.

Q. What kind of transmitters have you in Montreal?

Mr. WORTHINGTON: I object to this inquiry, on the ground that it has nothing to do with the examination in chief.

A. The above described instruments, largely. We also have a few other kinds in use.

Q. What proportion of your instruments is of the Blake transmitter type? A. In Montreal?

Q. Yes. A. Probably 90 per cent.

1794 Q. How is it in Toronto? A. Almost altogether the Blake transmitter type.

Q. Can you give the proportions or numbers exactly of the solid back transmitters and of the Blake transmitters? A. We have about thirty solid back transmitters in subscribers' stations at Toronto. The balance have the Blake transmitter described.

Q. Can you give me the number of subscribers in the city of Toronto in each year for the last ten years? A. I would have to look up the statistics to get that. We can do that, but it will take a little time.

Q. I should like to have that. Who manufactures the instruments used by you? A. At the present time the instruments are manufactured for the Bell Telephone Co. by the Northern Electric & Manufacturing Co. of Montreal.

Q. What instruments or appliances of any kind used in the business are manufactured by the Northern Electric Co.; or, if it manufactures generally all such equipments, or nearly all such, indicate what parts you buy elsewhere. A. It manufactures all such classes of instruments, switchboards, telephones, batteries, fire alarm apparatuses and other electrical apparatus.

Q. Do you pay a royalty on the switchboard and instruments used by you, or do you buy them outright? A. No, sir; we pay no royalty on the switchboards manufactured. We buy them outright.

Q. You pay no royalties on your instruments? A.

1795 We pay no royalties on our instruments.

Q. What do you pay for your telephone equipment for subscribers' stations? A. That is a question I am not able to answer, as, in the first place, we do not buy the equipment by subscriber's station. In the second place, the accounts for such work do not come into my hands.

Q. Who does the buying? A. Such apparatus is purchased by order from the secretary or president of the Bell Telephone Co. of Canada.

Q. Have you no information as to the cost of the various parts of the equipment? A. Just a general information, based upon what we estimate the cost.

Q. You have, in answer to the questions asked you in chief, given the cost of various parts of the equipment. How did you acquire that information? A. That applies to material, and to such material as the Northern Electric Manufacturing Co. does not furnish.

Q. Still that does not answer my question. How did you acquire your information as to that part of the supplies? A. The materials spoken of, such as cross-arms, wire insulators, etc., are articles that are used daily, and I have a knowledge of them from seeing quotations in the president's office occasionally, and also from memoranda furnished by the stores department, showing what we are to charge for material when we estimate for use of the different offices.

1796 Q. Have you not in the same way obtained information as to the cost of the subscriber's equipment? A. I could not give it accurately from memory. We have in the office a list of the articles we most generally use, and from that figure on the cost of equipment.

Q. Will you obtain that list and then inform me of the cost to your company of the subscriber's equipment? A. I can do so as far as that list goes. I will not say that that list embraces everything the company uses.

Q. Please obtain it, and let us see how far it goes and what is lacking in it.

(The witness retired from the room and subsequently returned with the list above referred to.)

A. We estimate the subscribers' sets at $12.05 each, or $15 placed.

Q. That is, I take it, the cost of the entire apparatus or equipment before setting it up, $12.05, and to that you add the cost of the labor and necessary wiring? A. And the fittings of the window.

Q. Is that for the Blake transmitter or the solid back? A. That is for the Blake transmitter.

Q. What is the cost of the solid back instruments? A. I haven't it on this list. I think it is about $10 or $10.50.

By Mr. WORTHINGTON:

Q. Do you mean it costs less than the Blake? A. No; he asked for the transmitter only.

By Mr. BIRNEY:

1797 Q. My question was meant to cover the cost of the subscriber's equipment provided with the solid back transmitter. A. We figure each article separately. We figure the cost of the solid back transmitter at $10 or thereabouts.

Q. Can you now give me with those items before you the total cost of the subscriber's equipment, with the solid back transmitter? A. It would be about $22.

Q. When was the Northern Electric Manufacturing Co. started? A. Between two and three years ago.

Q. It is in operation now, is it? A. It is in operation now; yes, sir.

Q. That company is owned by the Bell Telephone Co. of Canada, is it not? A. They are shareholders in that company.

Q. Does not the Bell Telephone Co. of Canada own all the stock? A. No, sir; I own some as a shareholder, and there are other shareholders, I believe.

Q. What is total capitalization? A. $150,000.

Q. How much of that is owned by the Bell Telephone Co. of Canada? A. I think over 90 per cent. of it.

Q. How much over 90 per cent.? A. Probably 95 per cent.

Q. Is the telephone equipment in Toronto of a good
1798 type? A. It is the type of equipment that was considered as the standard when it was put up, in 1893. It is gradually being changed to the most modern type. We are putting a large quantity of the overhead wires underground this year, and intend to continue to do so until we have the larger portion of the wires under ground.

Q. Why is that to be done? A. In order to get our plant in a condition that will be satisfactory to us. One reason is because it is growing, and the growth has to be taken care of. With the existing poles, the overhead wires and cables would be so numerous, that it would become dangerous to continue adding to them in the congested portions of the city, and there is no other way to take care of the plant except to put it under ground, if you want it to stay there.

Q. Is there any other reason than the great growth which induces you to put it under ground? A. I do not know what particular reasons the board of directors may have in their minds. They are the people that settle that. They order me to do the work, and I do it.

Q. Do you not advise with them? A. I advise sometimes with the president; yes, sir. I point out to him, for instance, that certain routes are becoming congested, that it is not possible to get other pole routes up in that section to carry wires, and that either one of two things must be done, either the
service must be abandoned or facilities must be given,
1799 and the only way to give them is to put the wires under ground. In such cases I suppose he considers the recommendation and submits it to the board.

Q. Is the service in Montreal underground or overhead? A. The portion in the central part of the city only is underground.

Q. How much of it is underground? A. I have not gone into a calculation of it, but I should say not over a quarter of the wires in the city are underground—a quarter of each subscriber's line. A large percentage of it is overhead yet.

Q. Are you putting any underground in this city? A. Yes, sir; we are doing the same in this city as we are doing in Toronto, largely putting our lines underground; and not only there, but in numerous other cities where we find our poles are getting overloaded.

Q. When did you begin to put the system under ground? A. I think about 1890 we began.

Q. How many instruments were there in Montreal at that time? A. That I will have to procure from the books. I have now obtained the information as to the number of subscribers in Toronto in the last ten years, and they are as follows: In 1889, there were 2,969 subscribers' instruments in use; in 1890, 3,439; in 1891, 3,940; in 1892, 4,354; in 1893, 4,611; in 1894, 4,732; in 1895, 5,033; in 1896, 5,219; in 1897, 5,492; in 1898, 5,932. I believe there were about 4,400 telephones in
1800 use in Montreal in 1890.

Q. Have you made any change in Toronto in that part of the system which remains overhead? A. I do not quite understand your question.

Q. Has your system of running the wires on poles continued to be as it was in Toronto? A. The instructions are now to use the block system of distribution, and this will be carried out in the changes which are going on now in consequence of the construction of underground work in Toronto at present. There will be a change in the method of running wires.

Q. What will be the difference between the present system and the block system? A. From the terminal or outside end of the underground cable, 25 pairs of wires will be carried naked on the cross-arms, the glass insulators only on the upper portion of the arms to be used, two adjoining pins to form a pair. The balance of the wires will be carried in aerial cables to a point where 25 pairs can be distributed in naked wires; and so on till the end of the route. In other words, what we consider the most modern and efficient construction will be carried out at Toronto.

Q. Under that system, how many pairs of wires will be carried on each cross-arm? A. Five pairs of wires on each arm.

Q. And how many cross-arms will there be? A. There will be five cross-arms as a maximum on each pole.

1801 Q. Do you know how many operators there are in Toronto? A. On the 31st of December there were 140 female operators and 16 male operators on the Toronto staff.

Q. By "operators" I presume you mean those who are ac-

tively engaged in receiving and sending messages from the exchange? A. Yes, sir; including supervisory operators, monitors, and others who have been looking after the switching.

Q. What is the maximum number of lines to any operator? A. 85, I think, is the maximum number of lines to any one operator.

By Mr. WORTHINGTON:

Q. You mean subscribers, do you not. A. 85 subscribers' lines to each operator. We have no party lines.

By Mr. BIRNEY:

Q. Do you have any force of night operators, as distinguished from a day force A. We have.

Q. How many operators are on duty during the busy portion of the day A. That I will have to refer to the pay rolls to ascertain, as I have not made an analysis in that way recently.

Q. Can you figure it out? A. I think so. Out of the total number of the staff referred to there will be about fourteen night operators.

1802 Q. And all the others are on duty during the day at the same time. A. No; that number includes those who are on at meal hours and to relieve other operators in the evening.

Q. How many of such extra operators, if we may so style them, are there? A. I cannot state the number, as our pay rolls do not show it, and there are no other means of getting at it, without applying to Toronto.

Q. Have you nothing here in the office to show it? A. I am afraid not. I think the pay rolls would simply indicate that an operator was paid so much, and would not say whether she was a regular full time operator or a relief operator. There might be confusion if you go by the amount paid, as a new operator would probably receive the same salary as the relief operator.

Q. Please give me the average number of subscribers' lines cared for by each operator on regular duty during the day. A. At the Yorkville exchange—

Q. My question refers to Toronto. Is that one of the exchanges in Toronto? A. I might say that we have three exchanges in Toronto known as Parkdale, Yorkville and the main exchange. At Parkdale the operators take care of 92 subscribers' lines each, at Yorkville 104 lines each and at the main exchange 85 lines each. The average is 91 lines per position.

Q. In which office? A. The average of the whole, you asked me for.

1803 Q. What is the average number in the main office? A. The number of lines per operator is 85 in the main office.

Q. Please give us a little explanation of the relations which Parkdale and Yorkville have to the city of Toronto proper and the main office? A. Yorkville and Parkdale are suburbs of Toronto. The former is on the north side of Toronto and the latter on the west side. They really form part of the city of Toronto, but as the localities are called Yorkville and Parkdale, we have given those names to those two branch offices, which are situated in the city of Toronto, and form part of the regular telephone exchange of the city.

Q. The subscribers at those places, then, have connection with all the subscribers throughout the city of Toronto, as if they were connected regularly with the main office? A. They have. They are all part of the exchange system of Toronto.

Q. What is the capacity of the switchboards at each of these places? A. At the main exchange, there are 3,084 telephones in use; at Yorkville, 1,572; at Parkdale, 556; making a total of 5,212. There would be a slight difference between that and the total at the end of the year, because these figures which I have given now were as of the 10th of December, 1898.

1804 Q. What is the ultimate capacity of the switchboard in these places? A. The present capacity of the main exchange board is 3,600, with an ultimate capacity of 4,200. The Yorkville board has a present subscribers' capacity of 1,750, with a total capacity of 2,400; Parkdale has a capacity of 620 subscribers.

Q. Have the subscribers at those three offices means of telephone communication directly with more exchanges than those regularly connected with the three offices? A. There is a small exchange of about 30 subscribers in what is called Toronto Junction, forming a small suburb to the northwestward part of the city. A few subscribers in Toronto have unlimited connection with this exchange, but the others pay toll for their connection. Otherwise there are no other free connections out of Toronto.

Q. Long distance connection, I suppose, can be had by any one of these subscribers with any part of your territory? A. Yes, sir; it can be had to any part of our territory covered by long distance lines.

Q. What is the average number of calls per subscriber daily at Toronto? A. The number of calls per line per day is 13.8.

Q. What is it in Montreal? A. The number of calls per line per day at Montreal is 12.6.

Q. Where and from whom did you get your informa-

1805 tion as to the extent of the operating staff in Washington? A. I got some of the information from the testimony in this case, and I got some of it from Mr. Crandall.

Q. What do you include in that term "operating staff?" A. The statement was made in the testimony of one of the witnesses that the operating staff—

Q. I ask you yourself what positions or persons you include in the term "operating staff?" A. I include the operators necessary to carry on the work in the office.

Q. Only the girls and other persons, then, employed in the operating room? A. Yes, sir; that I consider the operating staff.

Q. Please tell me the officials who are engaged in the operation in any way of your plant in Toronto, excluding (unless you have the figures before you, in which case I would like to have them) the laborers and outside force. A. To give you that information I would have to take the pay-rolls and read off the names of the officials and their duties.

Q. I do not care for the names. The positions are what I want.

(The witness left the room and subsequently returned with the pay rolls above mentioned.)

1806 A. The local manager, cashier, bookkeeper, superintendent and foreman of linemen. Those are all the local officials except the managers of the different exchanges, which we term chief operators.

By Mr. WORTHINGTON:

Q. Three chief operators, then? A. Yes.

By Mr. BIRNEY:

Q. Are there any other office employees? A. Yes; quite a number of them.

Q. Please give them. A. In the agency office at Toronto there are seven clerks and four collectors; in the operating department two clerks; in the construction department one clerk. Did your inquiry comprise linemen?

Q. If you have the linemen before you, I would like to have the number. A. In December there were 38 linemen, two subforemen, two cablemen, a carpenter, teamster, caretaker and 22 instrument men, or inspectors.

Mr. WORTHINGTON: Caretaker means janitor?

A. Janitor; yes, sir. Four men, one-half of whose time is engaged on instrument work.

By Mr. BIRNEY:

Q. Instrument repair and setting up? A. Instrument repair. The other time they act as relief operators.

1807 Q. Do they do the work of installing? A. I believe they help in that work. I do not think they are the men who install, but they are the men who help. The instrument men do the work of installing.

Q. These last are the persons who install new telephones? A. And also repair telephones that are already installed.

Q. That does comprise the entire list of employees at that office? A. Yes, sir; that comprises the local agency staff.

Q. Do the employees in the agency office, as you term it, have to do with the instruments which are rented, or only with long distance work? A. What employees have you reference to?

Q. Seven clerks and four collectors. A. It is part of their duties to keep account of the long distance work and the collection of long distance tolls, as well as the exchange work proper.

Q. In giving this list you have been testifying with pay-rolls before you, have you not? A. It is an analysis from the pay-roll of December, 1898.

Q. Will you then please give me the salary paid the local manager? A. As local manager he gets a salary of $208.33 per month, $2,500 per year. The cashier gets $1,000 a year.

Q. The bookkeeper? A. $600 a year.

Q. The superintendent? A. $1,760 a year.

1808 Q. The foreman of linemen? A. $1,200 a year.

Q. Three chief operators? A. Parkdale $360 a year; Yorkville $480 a year; Main $480 a year.

Q. What do you pay your clerks each? A. There are seven clerks down here, at $230 a month for the seven.

Q. And the two clerks in the operating department and one in construction? A. The first clerk in the operating department gets $720 a year and the other one $300. The four collectors get a total of $90 a month, $1,080 a year.

Q. The two clerks in the operating department get $1,020 together? A. Yes, sir.

Q. And the construction department clerk? A. $65 a month, $780 a year.

Q. The 38 linemen? A. The 38 linemen are paid altogether $1,542.50 a month.

Q. The two sub-foremen? A. One sub-foreman gets $75 and the other $55 per month.

Q. The cable men? A. The cable men get $50 per month each. The 22 instrument men get $785 per month altogether, $9,420 per year. This is a winter month, when business is very slack, and it does not give a good average of the year's line-

men, because the work of construction repairs and that
1809 sort of thing is all done in the summer.

Q. The carpenter? A. The carpenter gets $45 per month; the teamster $35 a month; the store-room man and caretaker each get $40 a month. I might say that while Mr. Dunston's salary on the pay-roll is shown at $208.33 per month, he has for some years past been given an allowance of $500.

By Mr. WORTHINGTON:

Q. Who is Mr. Dunston? A. The manager of the Toronto office—$500 per year, making his salary $3,000.

By Mr. BIRNEY:

Q. The four men half of whose time is put on instruments and half as relief operators. You have not given us their salaries. A. Those four men get a total of $82.50 per month.

Q. You have said the local manager receives $500 more for something. What is that something? A. He does not perform any services outside of local managership, and I presume it was given by the president—I can only assume; I do not know what it was really given for—as a bonus for good management.

Q. How long has that payment continued? A. I believe it has continued for some years now.

Q. Have you a local manager in Montreal? A. Yes, sir; we have a local manager in Montreal.

Q. What salary does he receive? A. He receives a
1810 salary at the rate of $2,500 per year.

Q. How many exchanges have you in the city of Montreal? A. Four; and one in the suburb called Westmount.

Q. Which is the largest one; how do you designate it? A. The main exchange.

Q. How many subscribers' lines are cared for in that exchange? A. 2,627.

Q. For how many subscribers does each operator in that office care on an average? A. 79.6.

Q. What is the next largest exchange in the city? A. What is known as the Uptown Exchange, situated in the western part of the city, having 1,892 subscribers' lines.

Q. For how many subscribers does each operator care in that exchange? A. Each operator cares for 126 lines. Do you want them all? A. Yes; you might as well give them; there are only two more. A. The East exchange has 1,204 subscribers, each operator taking care of 120 lines. The South exchange has 424 subscribers, each operator taking care of 84 lines. Westmount has 408 subscribers' lines, and each operator takes care of 139 lines. I might say in answer to your question a little

while ago, as to the number of subscribers in Montreal, that there are 6,555, according to our January returns. My previous answer as to the 7,260 subscribers in Montreal re-
1811 ferred to the present time.

Q. Can you approximate for me the population in each of the cities of Montreal and Toronto? A. Montreal has a population of about 250,000, and Toronto a population of 200,000.

Redirect examination.

By Mr. WORTHINGTON:

Q. You stated that there are about 30 solid back telephones in use in your exchange in Toronto. Are they furnished at the same rate at which the other telephones are furnished? A. No, sir; they are charged for at an increased rate. The rate for the service furnished by these transmitters is $70 per annum each.

Q. I meant to have asked you on your direct examination why it is that, if the agreement between the Bell Co. of Canada and the city of Toronto has run out, is no longer in force, you continue to charge the same rates fixed by that agreement?

Mr. BIRNEY: That is objected to as entirely immaterial.

A. That is a matter for the board of directors. I have nothing to say as to that.

Q. Is there any act of Parliament which applies to it?

Mr. BIRNEY: Objected to.

A. The matter is now before Parliament, and I am not competent to say what position we can take in the matter.

Q. Mr. Birney has inquired of you as to the number of
1812 subscribers in Toronto each year for ten years. Are you able to tell us whether or not the cost per subscriber increases or diminishes or runs about the same with the increase in subscribers? A. For that particular place and those particular years the books would have to be referred to; but, speaking generally, the cost increases as the number of subscribers increases in any given exchange.

Q. Do you mean the total cost or the cost per subscriber? A. The cost per subscriber, just the same as the total cost.

Q. Referring now to the question asked you a few moments ago in reference to maintaining the contract rates in Toronto after the expiration of the agreement, I will ask you if, by the act of 55-56, Victoria, Chapter 67, of the Canadian Parliament, assented to on the 9th of July, 1892, it was not provided that the existing rates (referring to charges by the Bell Telephone Co. of Canada) shall not be increased without the consent of the Governor-in-Council. A. It is true that there is such an amendment to the charter; and we have applied to the Governor-in-

Council to be allowed to increase; but so far, as far as I am aware, there has never been any answer given by the Governor-in-Council to our demand for an increase in rate.

Q. Do you know why an application has been made for an increase of the rates in Toronto? A. Because we are not doing business there at a profit. We did not make application
1813 for Toronto alone, but for Canada generally.

Q. You have stated in your cross-examination that the subscribers of the several Toronto exchanges have long distance connections. Are they entitled to the use of the long distance lines for what they pay for their telephones, or do they pay extra for that? A. They pay for any communication they have over our lines outside of the city of Toronto, except, as stated, with reference to the Toronto Junction exchange. They are charged the regular rates for all other communications. That is provided for in their contracts.

Q. You have given on your cross-examination the average number of calls per day in Toronto as 13.8. Do you know whether that average rate has increased or decreased as the number of your subscribers in Toronto increased? A. I have not the figures before me, but I know that the increase in the number of calls per subscriber per day has been going on in Toronto as the number of subscribers increased.

Q. Have you had any experience that will enable you to tell us as to whether the people in the United States cities use their telephones as often or oftener than those in Canada under similar conditions? A. We get statistics occasionally from the American companies; and from those, and from information I have gotten from managers in visiting the various exchanges, I have concluded—

1814 Mr. BIRNEY: I object at this point, unless the papers are produced from which the information is derived. A. (Continuing) That the telephone is used more generally in the United States, with a given size exchange, than in Canada.

Q. As to the list of employes and their saalries in Toronto, where is the principal part of the bookkeeping relating to the Toronto exchange done? A. The only bookkeeping done in Toronto is the local bookkeeping—keeping the accounts with subscribers. All the bookkeeping outside of that is done at Montreal, practically all the material being sent from this office, and accounted for here.

Q. There is no purchasing, then, done by the Toronto employes? A. It is such a trifling amount it is inappreciable.

Q. Has the Bell Telephone Co. of Canada any central office in the Province of Ontario? A. They have a departmental office at Hamilton, Ontario, where there resides the manager of a department, who has charge of all the business from Kingston westward to the western boundary of Ontario.

Q. Does that include Toronto? A. That includes Toronto.

Q. What force has he? A. He has with him a superintendent of construction, an assistant, and about six clerks. Besides that, he has a stores department, from which material is drawn for the various offices in his department.

1815 Q. Can you give us his salary and the salaries of the other persons who are under him? A. Having the pay roll for May, 1899, before me, I give the salary of the manager of the Ontario department as $3,750 per year; the chief clerk, his assistant, $1,500; the superintendent of construction, $2,100; six clerks, $2,460 per year; storeskeeper, $600; storeskeeper's assistant, $540; superintendent of repair shop, where the repairs are done for the Ontario department at Hamilton, $900; three repairers, $666 per year for the three. That is the staff of the Ontario department.

Q. How many subscribers have you in Ontario, including Toronto; in other words, what is the proper proportion of the salaries which you have just enumerated, at Hamilton headquarters, which should be charged to the Toronto exchange? A. About 15,200 subscribers in the Ontario department.

Q. What, in your judgment, is a fair proportion of the expenses of this main office at Hamilton which should be charged to the exchange at Toronto? A. One-third of the expense.

Q. Are there any expenses at that Hamilton office aside from these salaries? A. There is the rental of the building and the other expenses that go to care for the office. Then there is a staff of men kept on as department men, inspectors, instrument repairers, and men of that class, who

1816 might be called at any time to Toronto to do work in case of an emergency. They are not assigned to any particular station, but are moved about the country as wanted.

Q. Toronto gets a proportion of their work? A. It gets some proportion.

Q. In round numbers, what would those expenses amount to—office rent and these men who go wherever they are wanted. About what would that all amount to? A. It is very hard to determine that, because I am not familiar with the proportion of the men's time that they engage in any one agency. The accounts are made up at Hamilton and forwarded to the secretary here.

Q. Can you tell me what are the expenses of this central office of the Bell Telephone Co. of Canada? A. What do you mean by this central office?

Q. I mean the headquarters in this building, in which this testimony is being taken—the head office. A. We figure $7 per year per subscriber as the head office expenses.

Q. Then by multiplying the number of subscribers at Toronto by that sum, you can get at the head office expenses properly chargeable to the Toronto exchange? A. Yes, sir.

Q. How many operators' positions have you at the several switchboards of the exchanges in Toronto? A. At the main exchange, 36 operators' positions; at the Yorkville exchange, 15; at the Parkdale exchange, 6; making a total of 57.

1817 Q. Those figures then would represent the number of operators engaged at one time in the busy part of the day? A. That is what they represent.

Q. Taking the Montreal exchange, how does it happen that in the main exchange, with 2,627 subscribers, each operator takes care of only about 80 subscribers, while in your Westmount exchange, each operator takes care of 139. Why is it one operator can take care of so many more subscribers in one exchange than in the other A. The reason is that the percentage of calls differs. The Westmount exchange is in a residential portion of the city, and the number of times each subscriber uses his line per day is 9; whereas in the central part of the city, where the main exchange is situated, each subscriber uses his telephone 15 times per day. Consequently the operators at these two exchanges do practically the same amount of work, although one takes care of only 79 subscribers and the other takes care of 139.

Recross examination.

By Mr. BIRNEY:

Q. How many exchanges has the superintendent at Hamilton under his direction? A. About 150 exchanges of five subscribers and over.

Q. How many agencies? A. 200 agencies.

Q. What duties does he perform in connection with the Toronto exchange? A. He is in charge of that exchange the same as he is of all other exchanges in his district, and

1818 the manager is responsible to him for the proper performance of his duties and those of his subordinates. Any matters affecting the operation of the exchange or the construction thereof are referred by the manager at Toronto to the manager of the department at Hamilton, and he settles all matters that are not of sufficient moment to be referred to the head office for attention.

Q. What duties does his superintendent of construction discharge in connection with Toronto? A. More in an advisory capacity than in anything else. As the construction work is, to all intents and purposes, in the hands of the foreman of linemen, the superintendent of construction does not do any work himself directly in Toronto, other than to see that the

work is done in accordance with the requirements of the company.

Q. Does he in fact superintend the work of the superintendent in Toronto? A. No; except, as I say in an advisory capacity. He does not go there for the purpose of directing it, but if he were to find the work not done according to the requirements of the company, it would be his duty to have the matter attended to.

Q. Is he superior to the superintendent at Toronto? A. He is, yes, sir.

Q. And are reports made to him by that officer? A. The reports are made through the local manager to the manager of the department, and if they apply to the construc-
1819 tion, they are referred to the superintendent of construction at Hamilton. There is no direct connection ordinarily between the foreman of linemen and the superintendent of construction. The channel is through the managers of the different departments.

Q. What duties does the superintendent of repairs of the Ontario department discharge in connection with Toronto? A. All defective telephones or defective telephone apparatus that can be readily repaired without very much machinery would be sent to Hamilton and there repaired by the superintendent of the repair shop. He performs the duties not only for that office, but for any office in the Ontario Department sending in defective apparatus.

Q. And the repair shop for the whole department is maintained at Hamilton? A. It is maintained at Hamilton.

Q. Do the three repairers carried on that list do any work in Toronto? A. They do not do any work in Toronto. Their duties are confined to the repair shop at Hamilton.

Mr. WORTHINGTON: They do it for Toronto? A. For Toronto and other places in the department.

By Mr. BIRNEY:

Q. Mr. McFarlane, you testified that your company has made a request to the Governor-in-Council for leave to increase its rates in Canada. When was that request first made? A. It must have been about two years ago.

1820 Q. Was it not prior to that time? A. I am speaking from memory. I would have to look up the documents to ascertain. (After examining petition.) The petition was made on the 28th of January, 1897.

Q. Such leave has not been granted? A. Not yet.

Q. You testified you are not doing business in Toronto at a profit. Do you ascribe that to the large number of subscribers? A. Not altogether. I ascribe it to the fact that we

are trying to give a good reliable service, and in doing so we find it costs more to do so than we can make out of it.

Q. How long has your company been doing business in Toronto? A. Since 1880.

Q. What were the rates before the agreement was made with the city in 1891? A. $50 for places of business and $30 for residences, with a mileage charge over a one-mile limit from the exchange. That was on a grounded line service, single line.

Q. Had you made money up to that time in Toronto? A. I am not prepared to say. At that time I was not in close touch with it, as I had not charge of that department. It was managed entirely by Mr. Baker, the Ontario manager. I only took charge of Toronto and the other places as general superintendent in June of 1896.

Q. And you are unable to say when it was you first
1821 commenced to lose money in Toronto? A. I am unable to say when the company first lost money in Toronto.

Q. Are you making any money in Montreal?

Mr. WORTHINGTON: I object to that question as not relating to the examination in chief.

A. I have not looked at the records for a long time, but I do not think we are making any money in Montreal. I am pretty sure we are losing money in Montreal.

Q. When did you last look at the records? A. About a year ago or more.

Q. When did you last look at the records in Toronto? A. About a week ago. I got the figures from Mr. Slater, the secretary-treasurer of the company. On comparing those figures with the number of subscribers, I ascertained that we were not making any money in Toronto.

Q. You did not yourself examine the books? A. Not to go through them, no, sir, I did not.

Q. You have in your position, as I have understood, rather from what you intimated than what you said, nothing to do with the financial affairs of the company A. I have nothing to do with the financial affairs of the company; but if I asked for a statement of any certain office, the secretary would furnish it to me; and I take his figures as correct.

Q. That is the source of your information then as to the profit or want of profit in Toronto? A. That is my source of information.

1822 Q. And have you no similar information as to Montreal? A. I do not recall any statement we made up for Montreal especially since the early part of last year. I think we made up one, and if I recollect right that one shows a loss.

Q. How is it in Quebec?

Mr. WORTHINGTON: The objection is renewed.

A. In Quebec, up to last year, in fact up to March of this year, we gave a single wire grounded service, Blake transmitter, and from the statements I had in regard to Quebec, we were making a profit in Quebec.

Q. What rates are charged in Quebec? A. One year terms for business, $40; one year terms for residences, $30; three-year terms for business places, $35, and for houses, $25.

Q. Are you making any money in Ottawa, with 1,508 telephones?

Mr. WORTHINGTON: The same objection.

A. No, sir; not from the statements I got last year, we were not making money at Ottawa.

Q. What rates do you charge in Ottawa? A. We have a contract with the city of Ottawa by which we charge $40 for business places, and $25 and $30 for residences.

Q. What are the rates in Montreal? A. $50 for business places and $30 for residences.

Q. Please give me the number of business telephones and the number of residence telephones in the city of Toronto.

1823 A. There are 4,060 telephones in business houses and 1,872 in residences. The total, 5,932, was the number as of the 31st of December last.

Q. At what time does your knowledge of the number of calls in Toronto begin? When did you first have the knowledge of the number of calls per subscriber? A. I have had a general knowledge for some years in simply discussing the matter with the different managers, and their taking records at different times for purposes of comparison.

Q. Have you any of those records in your office? A. The only Toronto ones I have will be of a late date, the latter part of last year or the beginning of this year.

Q. Have you no record of any enumerations of an earlier date? A. I do not think I could find any, as I cannot recall that these records were preserved, being simply made at the time for the purpose of comparison with other stations.

Q. Have you any means in the office by which to inform yourself as to the number of calls per subscriber in any year but the present since 1890 in Toronto? A. Yes, sir; we have statistics showing the calls per subscriber at the end of each year. This fact is just brought to my mind by your asking the question, that we get annual statistics from Toronto showing the average calls in certain days during the month of December.

Q. Can you lay your hands upon those statistics? A. I can to-morrow. To-night the office is closed.

1824 Q. I should like to have them to-morrow. You have stated that the cost per subscriber, in your opinion, increases with the number of subscribers. Have you been able to fix in any way the number at which the cost begins to increase per subscriber? A. I have not. I have not given the matter special study in that direction.

Q. To what extent have you made a study of that subject, if at all? A. I have, at various times, made comparison with different officers, and as the offices grew in size, I discovered that the number of calls per subscriber would increase out of proportion to the number of new subscribers that were taken on. This resulted in our having to employ a larger staff of operators in proportion to the number of subscribers, and a large number of linemen in consequence of the greater masses of wires and the greater possibilities of trouble and interruption. A greater complication also arose in the switching apparatus, making faults increase very rapidly, thus necessitating a larger repair staff. As an example, I might say that when I started the Montreal exchange, one operator was able to take care of 100 subscribers. To-day we require at least one operator for every thirty subscribers.

Q. Is that the complete explanation which you are able to give of the supposed increase of cost? A. That is all I think of at the moment.

Q. Is there any increase of cost per subscriber between 100 and 300 subscribers? A. Naturally there would be,

1825 because each one of the 300 subscribers has access to two-thirds more subscribers than if there are only 100. Consequently they will use the telephone more and will require more attention.

Q. You think it would be less profitable to have an exchange of 300 subscribers than one of 100 subscribers. A. It would be less profitable at the same rate, I should think.

Q. Less profitable? A. I should think it would be less profitable at the same rate.

Q. But for the purpose of making money, you would prefer to have the 100 subscriber exchange to the 300 subscriber exchange? A. Taking that merely as an example of the conditions, I would say yes.

Q. Would the same rule hold good as between 300 and 500 subscribers? A. It would, to a more limited extent, possibly.

Q. Why more limited? A. Because I find that we can operate an exchange of 100 subscribers usually with one operator, and when there are between 300 and 400, the number of operators increases; so that, while you could handle 100 with one operator, I do not think you could handle 300 with two opera-

tors and give good service. It would depend largely upon the use the subscribers make of the exchange.

Q. Could you handle them with three operators? A.
1826 It would depend, of course, upon the use that is made of the exchange. When you go into small units like 100 and 300, there is not a very vast difference; but when you go from 100 to 1,000 or from 1,000 to 5,000, there is a very great difference in the cost per subscriber.

Q. Do you know of any exchange of 300 subscribers within your jurisdiction which reqiures the service of more than three operators? A. I do not recall any exchange of about that exact number, but we have exchanges of a less number requiring three operators.

Q. How many less? A. For 267 subscribers we have three operators.

Q. Have you any exchange of 500 or thereabouts requiring more than five operators? A. We have Kingston, Ontario, with 510 sets of instruments.

Q. Have you any exchange of about 1,000 subscribers A. We have London, Ontario, with 1,124. That is the nearest to 1,000.

Q. At Ottawa, you have, according to the statement you have given me, about 1,508 subscribers. Will you please give me the number of operators. A. That was the number we had on the 31st of December.

1827 By Mr. WORTHINGTON:

Q. After the application to the Governor-in-Council for an increase of rates in Toronto, were the books of your company relating to its financial transaction in Toronto examined by agents employed by the government? A. I saw those agents here at work on the books.

Q. Do you know whether or not they found that the company's claim as to business being done at Toronto at a loss was verified by their examination?

Mr. BIRNEY: Objected to as clearly calling for hearsay testimony.

A. I cannot say, with the exception of hearsay.

Q. You have stated that you understood business was done at Quebec at a profit, and the rates charged were $35 to $40 for business and $25 to $30 for residence telephones. What kind of a plant have you at Quebec? Is it overhead or underground? A. It was entirely overhead, iron wire, single grounded circuits, on cedar poles, eight pin cross-arms, wires above and below the cross-arm, so that there were fourteen subscribers' lines on each eight pin arm, in most parts of the city, cabled with single wire.

Q. Did you use the Blake transmitter entirely? A. Entirely Blake transmitter; yes, sir. There may have been three or four solid backs, but not more.

Q. If there were three or four solid backs, were they charged for at the rates you have specified? A. They were furnished at an increased rate.

1828 Q. Do you know what that was? A. No; I cannot tell what that exact price was, because some of them were long lines running out in the country—one or two long lines.

Q. What kind of equipment had you at Ottawa when the rates charged there were $40 for business and $25 or $30 for residences? A. At that time, when the contract was made, we had a single wire grounded system, but we started and did some underground work. We put our wires underground from the main exchange, metallic circuits, to different points, where they were opened and carried in lead-covered metallic circuit cables to distributing points; and from there they were generally grounded lines. There are some lines in the central part of Ottawa that are metallic circuit lines. There were no metallic solid back transmitters there at the time when that contract was made. We had single standard boards in Ottawa, with no multiple arrangement to them.

Q. What kind of equipment do you furnish at Montreal; what kind of a plant? A. At subscribers' stations we furnish Blake transmitters and magneto bells at the $50 and $30 rate. Those having solid back transmitters—there are a few—pay $70.

Q. What kind of a plant have you? Have you an overhead or underground plant in Montreal? A. In Montreal the wires in the central part of the city are underground and overhead where they leave the underground. A portion of the subscribers' lines is composed of bronze wire, No. 17 gauge. The other portion of the lines is composed of No. 12 iron

1829 wire. The poles are of cedar and red pine, running from 30 feet in length up to 75.

Q. Averaging about what? A. Probably 55 feet.

Q. Having so many exchanges here, you can tell us what is the rule as to whether the rates are larger or smaller in exchanges with a few subscribers and exchanges with a great many. What is the rule? A. Where the exchange is small, we do business cheaper. As the exchange grows, we increase the price. Thus at Pembrooke, we will say, a small exchange—

Q. Of how many? A. 175 subscribers or thereabouts—the rate is $20 for business places; and in places like Ottawa, the rate is $40 for business places. In Montreal the rate for business is $50.

Q. What is the rate for business in still smaller exchanges, say of ten or fifteen subscribers? A. We have rates ranging from $10 to $20 per annum in the smaller exchanges.

Q. In those small places, what kind of plant do you have? A. In a place like Pembrooke we have fifty wire standard boards, cedar poles running from 30 to 45, in some isolated cases perhaps 50 feet, to get over trees, and iron wire grounded lines.

Q. Are you familiar in a general way with the rates that are charged by telephone companies in the United States?

A. We see the schedules of rates occasionally, and I
1830 have been to several places and learned what the rates are and what they charge in larger cities.

Q. I will ask you if it is not the general rule everywhere, so far as you know, whether the companies are of the so-called Bell companies or the so-called opposition companies, that the smaller the town and the fewer the subscribers, the lower the rate? A. My experience outside of Canada with opposition companies is very limited, but that holds good with the Bell companies in the United States, that the rates are low in the small places and high in the large places.

Q. You have said to Mr. Birney that in 1891, in Toronto, before that agreement was made as to rates, the rates were $50 for business and $30 for residences. What kind of a plant did you have there then? A. Grounded lines, single iron wires.

Q. Was there any underground plant there at that time? A. No, sir; I think not. I think we started our underground plant about the time we made the agreement with the city of Toronto. We may have had a few lines on what is known as the McLeur return, but there were very few.

L. B. McFARLANE,

Subscribed and sworn to before me this 3d day of June, 1899.

JOHN W. HULSE,
Examiner in Chancery.

The further taking of these depositions was thereupon adjourned until Saturday, June 3d, 1899, at 9:30 o'clock a. m.

1831 Office of the Bell Telephone Company,

Montreal, Canada, June 3rd, 1899, 9:30 o'clock a. m.

Lewis Brown McFarlane resumed the stand for further examination.

By Mr. WORTHINGTON:

Q. Mr. McFarlane, are you now prepared to answer the questions which Mr. Birney asked you yesterday, and which required an examination of documents? A. Yes, sir; I am.

By Mr. BIRNEY:

Q. Will you then please give me the statistics as to the calls per subscriber in Toronto in the years mentioned in my former question? A. On the 31st of December, 1893, the average number of calls per day per subscriber, from record taken a few days before that date, is 8.98; for the same period in 1894, 9.96; for the same period in 1895, 10.99; for the same period in 1896, 12.2; for the same period in 1897, 13.2.

Q. Are you prepared to give me the number of operators in the office at Kingston and in the office at London? A. From the pay-roll for April, 1898, Kingston has seven operators; London 27; Ottawa 35.

Q. Is the office at Kingston kept open at night? A. Yes, sir.

1832 Q. And the office at London? A. At London and also at Ottawa. It is a continuous service at these places.

By Mr. WORTHINGTON:

Q. Can you tell what is the average distance of your subscribers from the exchange in Quebec? A. The average distance of the subscribers' lines in Quebec is four-fifths of a mile each.

By Mr. BIRNEY:

Q. Can you tell me the average number of lines to the operator in London? A. In March, 1899, the average number of lines per operator at the busy hour of the day was 124.

L. B. McFARLANE.

By the Examiner, by consent.

Subscribed and sworn to before me this —— day of ——, A. D. 1899.

——————————,

Examiner in Chancery.

Ormond Higman, a witness of lawful age, called by and on behalf of the defendant in rebuttal, having been first duly sworn, is examined

By Mr. WORTHINGTON:

Q. Where do you reside, Mr. Higman? A. At Ottawa.

Q. What is your age? A. Forty-nine.

1833 Q. What is your occupation? A. Electrical engineer.

Q. In what way are you employed now as an electrical engineer? A. I was called upon by the Dominion Government in 1892 to inaugurate a system of electric light inspection throughout the whole Dominion, in connection with the weights and measures system of Canada; that is, to provide a method of testing the apparatus through which electricity is sold and for gauging the pressure at which the light is sold, and features of that kind, in a weights and measures point of view.

Q. Are you still in the employ of the Dominion Government? A. Yes.

Q. Have you been continuously since 1892? A. Yes.

Q. And in the same capacity? A. Yes.

Q. Have you had any experience in telephone matters? A. I have had some; yes.

Q. In a general way what has been your experience as to that? A. When the telephone was first introduced into Canada by the Montreal Telegraph Company—the franchise was then owned, I believe, by the Western Union and the Montreal Company—as electrician of the Montreal Company at Ottawa, I was called upon to provide the first exchange in that

1834 town. It was in connection with the telegraph. It was in the telegraph office, in fact. Of course, it was a very limited affair at that time; but I may say that I have pretty thoroughly exploited the telephone field, and I know generally what the telephone business amounts to.

Q. Have you had any experience in the matter of accounts, bookkeeping? A. Not a great deal; not as an accountant. As assistant superintendent of the Ottawa Division of the Montreal Telegraph Co. for twenty years I had the inspection of the offices, both with respect to the electrical part and the bookkeeping, and I was frequently called upon to audit the accounts of the different offices in the division, but I am not a professional accountant.

Q. Are you aware of the fact that in 1897 there was pending before the Governor-in-Council in Canada an application by the Bell Telephone Co. of Canada for leave to increase its rates in Toronto and other places? A. Yes.

Q. In connection with that matter did you perform any ser-

vice for the Dominion Government? A. Yes; I was called upon by the Secretary of State for Canada to investigate the claims of the Bell Telephone Co., and their books at Montreal, with a view of ascertaining, if possible, whether the statements set forth by the Bell Telephone Co. were correct.

Q. What were those statements, so far as they related
1835 to the city of Toronto? What was the claim of the Bell Telephone Co. in regard to that city? A. That they were working at a loss, I believe. I do not recollect the particulars altogether.

Q. In pursuance of that appointment or request from the Secretary of State, what did you do? A. I came to Montreal and demanded the books of the company—the ordinary books, the day-book, the ledger and other books, which would show the general working of the company, in two or three of the larger cities; and with their statements in my hand, I requested to have certain things shown to me in those books, where I would find the statements set forth. I found, I believe, so far as I can recollect now, and I think my report bears out the fact, that those statements were fairly well sustained. (The witness, in referring to "my report," refers to a printed document which counsel for defendant has in his hand.)

Q. Is the document to which you referred in your last answer the printed document entitled "Petition of the Bell Telephone Co. of Canada, Limited, to the Governor-in-Council, 28th January, 1897, with Statement of the Company's Case, etc."? A. Yes, sir; the letter is contained in that.

Q. I will hand you this volume and ask you to read from it the claim of the Bell Telephone Co., so far as it related to Toronto, which you were called upon to verify.

1836 Mr. BIRNEY: Objected to as incompetent.

A. Toronto Revenue and expenses, 1895:

		No. of Subs.	Per Sub.
Revenue.....	$172,719.56	4,710	36.67
Expenses.....	252,597.30		53.63
Loss.....	79,877.74		Loss— 16.96

Toronto system is all metallic circuit.

Q. You have perhaps stated the fact, but I will ask you whether or not the investigation which you made satisfied you that this statement was substantially correct as to the Toronto revenue and expenses in 1895?

Mr. BIRNEY: Objected to as incompetent.

A. Yes; the examination of the books of the company did satisfy me that their statement was substantially correct.

Q. Will you state whether or not you so reported to the Dominion Government?

Mr. BIRNEY: Objected to.

A. I believe the statement I made is contained in that report. You will find it in the last clause of my report, I think.

Q. I will ask you to read in evidence that part of the report to which you have referred, on page 27 of this printed document, which sets forth your conclusions.

Mr. BIRNEY: Objected to as incompetent.

A. "A careful examination of the company's books at Montreal, the freest access to which was readily accorded, proved the statements of revenue and expenditure which are
1837 contained in Exhibit "C" to be correct in every particular."

"In conclusion, the result of my examination has been to prove the correctness of the claims of the Bell Telephone Company, made in their petition, namely:

"That the introduction of electric railways or other industries using strong currents of electricity into cities or towns where there is an established telephone service using a grounded single wire system, necessitates a change to a metallic or double wire system, and when the overhead wires become too numerous the change has to be to underground construction. That the cost of construction of an underground metallic or double wire system is 300 per cent greater than a single wire overhead system, and that the cost of operating the former is at least 30 per cent greater than the cost of operating the latter, even without making allowance for the destruction of underground cables by electrolysis, to which I have alluded. Respectfully submitted."

Q. Is the statement which you read in evidence a few minutes ago in relation to Toronto revenue and expenses in 1895 a part of the Exhibit "C" referred to in the concluding words of your report which you have just read? A. Yes.

Mr. WORTHINGTON: Counsel for the defendant in announcing the direct examination of this witness closed, tenders to counsel for complainants, for his examination, the printed document from which the witness has been quoting.

Mr. BIRNEY: Do I understand you have offered Ex-
1838 hibit "C"?

Mr. WORTHINGTON: No; only that part of it which relates to Toronto.

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Higman, when you made your examination of the books did you have any assistance? A. No; none other than Mr. McFarlane, I think, or someone in the establishment here —I forget just who it was—to get the necessary books and to assist in finding the figures and statements set forth in their claim.

Q. Then you acted as your own accountant in the matter? A. Yes.

Q. You had no assistance from any professional accountant? A. No; not outside of the establishment.

Q. How long has it been since your business called you to examine accounts? A. About ten years, I think—no; I should not say that, because chief electrical engineer and superintendent of standards I have to prepare a statement for the Government Blue Book every year, and these are the accounts of that branch of the public service in Canada; so that I am examining statements in books more or less all the time, not as an accountant, of course. I do not want to mislead you about that.

Q. You never have pursued the business of a bookkeeper? A. No.

1839 Q. Or as an accountant? A. No.

Q. What books did you examine of the Bell Telephone Co. of Canada? A. I could hardly name them. The day-book, I think, and journal, and ledger, and such books as are used every day for the accounts of the company.

Q. Did you examine anything else than these books? A. No.

Q. Did you look at any original papers? A. I will not be certain as to that. I satisfied myself that the statements they made were borne out by the records of their office.

Q. Tell me what records, other than the day-book and the ledger, you looked at?

Mr. WORTHINGTON: He specified the journal.

A. The journal; yes. I will not be so sure now whether there were statements and contracts with subscribers. I cannot be quite certain as to that, but I called for all that I thought necessary to give me the information that I wanted.

Q. How did you know what was necessary? A. By a copy of the Bell Telephone Company's statement in their claim before the privy Council. They stated certain things, and I went over that statement as to the figures and statements, and asked them to produce the evidence of statements.

Q. Then you examined what was produced by them? A. Yes.

1840 Q. Again I ask you if you went over any of the original sources of information, vouchers or papers, other than the results of such papers which you found in the books? A. I can't say exactly whether I did or not. There was a mass of evidence of one kind or another, and I went pretty thoroughly into it. I was here two or three days making the examination. I cannot name all the papers that I looked at. My impression is there were other papers, outside of the books, statements of various kinds, such as statements as to any serious storm trouble they had had in Canada and Ottawa, and other things relating to expenditures they had made.

Q. Those were exceptional expenditures? A. Yes; I suppose they were. They are set forth in the report that I made, however.

Q. How closly did you examine the reports of the superintendent at Toronto? A. I made no difference as to any particular place. I think three or four cities were mentioned in the Bell Telephone Co.'s claim. I got the ordinary books of the company. I satisfied myself that there was nothing prepared specially for me. I took the ordinary bookkeeping of the company, and called for all the particulars that I thought were necessary to sustain the claims made by the Bell Telephone Co.

Q. Did you examine the items which entered into the expense account? A. Yes; my recollection is that I did.

1841 Q. Are you sure of that, or is that only an impression? A. Of course one, after the lapse of a couple of years, cannot be sure of every little item, but that is my impression. I wish to explain that when I was called down here I did not know what I was coming for. I did not know the first thing about it, and had no chance of refreshing my memory as to an examination of the report. I have only just this moment seen it, and only partially read it through; but, speaking generally, I am prepared to stand by the report made at that time.

Q. Over how many years did your examination extend? A. I do not recollect. It went back quite a number of years, I think. You see, I don't remember all the facts of the claim of the Bell Telephone Co.; but my impression is I went back quite a number of years.

Q. Can you now tell how many years? How far back? A. No, I cannot, at this moment.

Q. In what way did you reach your determination that the cost of operating an underground system exceeds that of operating an overhead system? A. Partly by the figures of the company and partly by my own general knowledge of the building of lines. I may say that I have built a great many telegraph lines in my time.

Q. That answer hardly seems to fit my question. You have had no experience in operating telegraph lines yourself? A. Yes.

Mr. WORTHINGTON: I object to the opening statement of the counsel, that the answer does not seem to fit the ques-
1842 tion, because the expense attending the installation of the plant necessarily is to be taken into consideration in estimating the cost of operating.

By Mr. BIRNEY:

Q. In this report you distinguish between the cost of construction and the cost of operating. Tell me where you have had any experience in operating an underground system? A. The first experience I had was in London, England, where a portion of the lines leading out from the main office in Paddington—that is the main or head office—are underground. In fact, a goodly portion of the telegraph service of London is underground. I may say that I was in the telegraph service in London and had some experience in underground work.

Q. What was your experience there in connection with that work? A. Operating the lines underground; and of course I have a general knowledge of the subject.

Q. What was your position in that company? A. My position was that of what they called an operator, but I may say with this difference: That I always had the habit of investigation, and while at that time I was an operator, as we would call them in Canada, still I always examined the ins and outs of everything connected with the working of the telegraph; and I was also in charge of an office, a town, in Devonshire.

Q. Are you speaking of telegraphs now? A. Of telegraphs. Of course it makes very little difference, I apprehend,
1843 whether it is a telegraph or telephone line, if it is laid underground, except probably that the telegraph would be more expensive, perhaps, than the telephone, because the insulation would have to be better.

Q. When was it you were so employed and when did you quit that employment? A. I was employed by the International and Electric Telegraph Co. of England from 1864 to 1869. That was the date when the telegraph system was assumed by the government there, and I came to Canada.

Q. During that period you were a telegraph operator? A. Yes; and agent for the company at Plymouth and at Exeter.

Q. Where were the books of that company kept? A. Every office had a separate set of books, of course, but the head office was at Paddington in London.

Q. During that period was there any change from overhead system to underground system in your district? A. Yes, un-

derground wires were constantly being laid in London during the time I was there.

Q. What access had you to the books of the company to determine the financial results? A. I had access to the bookkeeping of the company in England, if you mean at the head office. There were three different offices at Liscard, Plymouth and Exeter, where I had the keeping of the books.

Q. What was your opportunity to learn the difference in cost in operating an overhead and underground system. How were you enabled to make a comparison? A. I made
1844 no comparison—not as to the exact cost. Of course I learned in a general way. There are always opportunities of learning the difference in the cost of different systems and anyone with any intelligence, when affairs of that kind are represented in the technical press belonging to the country, would have means of information. As a general rule I made myself acquainted with the facts of these different systems. I have always been interested in the matter of underground work, especially for cities. I have always advocated that for telegraph purposes; but I am not prepared to give any evidence as to the exact cost of this or that particular system.

Q. Have you had any practical experience in the use of the underground system in telephone lines? A. No; what do you mean by experience?

Q. The use, I have said, or management of telephone lines. A. Of course the use of the telephone is the same whether it is above the ground or under the ground.

Q. Have you had anything to do, and if so what, with any telephone company in this country? A. Yes; I think I have already stated in my evidence here that I introduced the first exchange in Ottawa.

Q. When did your connection with that exchange terminate? A. I was only connected with it for a short time, as it was found it interfered with the telegraph business; and the Bell Telephone Co. was formed shortly after, and assumed the control of the whole thing.

1845 Q. What was that short time? A. I cannot remember now. It was a good many years ago.

Q. A few weeks or a few months? A. A few months at least.

Q. Since that time, have you been concerned in any way in the management of telephones either underground or overhead? A. No.

Q. Have you, since that time, investigated the relative cost of managing the two systems, in the accounts of any company?

Mr. WORTHINGTON: By "the two systems," you mean overhead and underground?

Mr. BIRNEY: Yes.

A. Not beyond the examination I made here.

Q. What was there on the books of the Bell Telephone Company of Canada to distinguish the cost of the overhead and the underground parts of their system? A. I do not remember.

Q. Was there anything? A. I dare say there was. I do not know what my report says. The facts are contained there.

Q. It does not say anything on that subject, I think? A. I am not prepared to go outside of that report, except in a general way. I cannot undertake now to particularize.

Q. Then you are not prepared to say you had any data from the books of the Bell Telephone Company of Canada
1846 which would show the relative cost of operating the overhead and the underground systems. A. I had all the data necessary to establish the facts contained in my report.

Q. Can you recall that anything was shown you, and if so, what it was, to show the cost of operating the overhead system, as compared with the cost of operating the underground system? A. I cannot recall them now; but, having a general knowledge of the system, I know pretty well, without any examination, that the statement I make there is correct. I may say that I have made tables in connection with water courses for the telegraph company; and I have a fairly good knowledge of the difference between the building of an overhead line and one underground. Of course I cannot, as I say, go into particulars.

Q. Do you recall whether anything was shown you in the books of the company to indicate that separate accounts are kept of the cost of the underground part of their system and of the overhead part, in Toronto? A. I do not recollect.

Q. Which system in Canada, the overhead or the underground, costs the more for repairs? A. It would depend a good deal on circumstances. I should say that the underground system would require less after it is once laid down, and if it were thoroughly laid in the first place. It would depend a good deal on the kind of work that was done; and then, as to the cost of repairs on overhead wires, it would depend, of course, on the kind of weather you would get.
1847 Q. Storms would be apt to injure the overhead construction more than the underground? A. Yes; I have seen in the city of Ottawa at least a mile of poles lying on the ground after one of the sleet storms we get in the winter here, which would cost probably $20,000 or $30,000 to rebuild.

Redirect examination.

By Mr. WORTHINGTON:

Q. Mr. Higman, when you made your examination of the books of the Bell Telephone Company of Canada, did you ask for anything that you wished to see there in the way of books or papers? A. I asked for what I wanted; yes.

Q. I would like to ask you to what extent the company complied with your request to exhibit its affairs to you by its books or papers, or give you any information you wanted? A. They said everything they had in their possession was open to my inspection, and that I was at liberty, if I so chose, to call in any person to assist in the examination. There was no attempt to restrict me in the nature of my investigation.

Q. If there was any limitation in the examination, or the extent to which it went, that limitation was made by you, and not by the company? A. Precisely.

Q. Was there anything you asked for that was not furnished? A. No.

1848 Q. Do you know what this case is in which you are being examined? A. I do not.

Q. Have you any idea of the bearings of your testimony upon one side or the other to-day? A. Not the slightest.

Q. Do you know who the parties are? A. I do not.

ORMOND HIGMAN.

Signature affixed by the Examiner, by consent of counsel.

CHARLES PAGE SCLATER, a witness of lawful age, called by and on behalf of the defendant, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. Mr. Sclater, what is your age? A. Forty-nine.

Q. Your residence? A. Montreal.

Q. What is your occupation? A. Secretary-Treasurer of the Bell Telephone Company of Canada.

Q. How long have you held that position? A. Since the inauguration of the company, in 1880.

Q. In a general way what have been your duties as Secretary-Treasurer of the company? A. Attending the meetings of the directors, attending entirely to the control of the disbursements and receipts of the head office portion of

1849 the company, and keeping the books of the company.

Q. What opportunities have you had to ascertain the expenditures of the company with reference to its exchanges in the city of Toronto? A. I have every opportunity, as all the documents have to come to me for custody.

Q. Where are the general books of the company, showing the receipts and expenses of the Toronto business, kept and where have they been kept since 1880? A. In Montreal.

Q. Under your supervision and direction? A. Under my supervision and direction.

Q. How have those books of account been kept, so far as relates to the expenditures and receipts in the city of Toronto? A. The Toronto local manager sends me a monthly statement of all his receipts and all the expenditures that he is authorized to make, such as paying the salaries and rents—things that are purely local. They are generally journalized and kept here. The basis of the account with Toronto, to that extent, is his monthly statement. Then from the other departments of the company, like the stores department or Ontario department, other charges come to me also. The local manager knows nothing about those.

Q. Have the books been kept by making entries in the usual course of business from day to day? A. Monthly, in my books.

Q. From the monthly reports? A. From the month-
1850 ly reports.

Q. Have the entries been made at the time or shortly after the receipt of the reports? A. Immediately.

Q. It appears that there is an office of your company at Hamilton which has to do with the different exchanges in the Province of Ontario. Where are the accounts of that office kept? A. They are also kept here.

Q. And as to the head office, here in Montreal, where are the accounts kept? A. They are kept here. Everything centralizes here.

Q. In distributing the expenses and receipts among the different exchanges, what proportion do you charge to the Toronto exchange, for example, of the Hamilton agency, and of the general expenses of the head office? A. We annually divide what are known as general expenses, which includes the departmental office as well as the head office, pro rata in accordance with the subscribers.

Q. Do you know the witness who has just been examined, Mr. Higman? A. I have seen him before.

Q. Were you at your office when he came here to make the examination to which he has referred? A. Yes, sir.

Q. I wish you would state to what extent you gave him such information as he desired, and what was done about his investigation? A. When he arrived, and I found what he
wanted, I placed all the books and the evidence lead-
1851 ing up to them before him for his examination. I gave
him anything that he asked for, and, in fact, more than he asked for. Everything that he could possibly ask for was put there for him to find.

Q. What can you tell us as to the correctness of the accounts kept in your books here which relate to the Toronto exchanges? A. Of course our accounts are properly audited, and they are carefully checked. Every voucher is checked before the entries are made, and the books have to balance.

Q. Do you have to refer to your books from time to time for information? A. Always.

Q. During your twenty years' experience, what have you ascertained as to whether the books have been correctly kept or not? A. I know that they have been. They have always been carefully audited, and have always passed every audit without any question; and the balance sheets have always come out properly.

Q. Will you state whether or not the books and statements which you exhibited to Mr. Higman were the ordinary and regular books and statements of the office, or whether they were something which had been specially prepared for the occasion? A. There was an item that was specially prepared and which was shown to him and acquiesced in by him—a pro rata expectation expense, I might call that.

Q. Something in relation to the future? A. What
1852 was expected to come immediately.

Q. As to the transactions then passed, were the accounts and papers which were submitted to him the regular and ordinary books and statements? A. They were.

Q. Will you tell us whether or not they were correct and true? A. They were correct and true.

Q. You are familiar with the statement which Mr. Higman read in evidence, as to the Toronto revenue and expenses for 1895, showing a loss per telephone per annum of 16.96 dollars? A. Yes.

Q. Who prepared that statement when it was originally presented to the Dominion Government? A. That was prepared by me—under my supervision.

Q. What can you tell us as to the correctness of that statement? A. That is correct, as stated at the time. It was on a system that was only just completed. Of course a portion of the expenditure was based on the depreciation assumed to arise from the new system of account. It was a matter of depreciation. That depreciation is not on our regular basis of ten per cent. depreciation. It is on a fifteen per cent. depreciation, which we had been informed was the proper one to reckon under the new system of metallic circuit underground system, which was new to us. That is the only difference.

Q. What is your regular allowance for depreciation?
1853 A. Ten per cent.

Q. Can you tell us what difference it would have made in this result if you had put the depreciation at 10 per

cent. instead of 15? A. Yes; I think I could. It would have made a difference of $34,311 in the expenses.

Q. What difference would that make in the loss per telephone per annum? A. $7.25 per subscriber. That would be at the rate of $9.71.

Q. Have you any statement more in detail showing how the result exhibited by this statement which Mr. Higman read in evidence was reached? A. I have a similar one at a later date. I have just prepared 1897 and 1898.

Q. Corresponding statements for those years? A. Corresponding statements; yes.

(The witness hands counsel for defendant two statements, one headed "Toronto Exchange, 1897," and the other "Toronto Exchange, 1898.")

Q. Is this statement which you have just handed me a correct statement of the revenue and expenses and net loss of your Toronto business for each of the years 1897 and 1898? A. Yes, sir.

(Counsel for the defendant here offer this statement in evidence, and by consent of counsel, it is at this point copied into the record, instead of being filed, all objection to the substance being reserved.)

1854 Mr. BIRNEY: Objected to, it being evident that these documents are made up from other material, and are not original in any sense.

The above paper is as follows:

Toronto Exchange, 1897.

5,330 Subscribers.

Revenue	$189,591.96
Expenses, including 10 per cent. depreciation on amount of capital, $680,336.35	212,459.45
Loss	22,867.47

Toronto Exchange, 1898.

5,932 Subscribers.

Revenue	$205,253.36
Expenses, including depreciation of 10 per cent. on amount of capital, $711,538.37	219,969.14
Loss	14,715.78

By Mr. WORTHINGTON:

Q. Have you prepared a statement more in detail covering the same matters that are shown by this exhibit just introduced? A. Yes.

Q. Let me see it, please.

(Witness produces a paper and hands it to counsel for the defendant.)

Mr. WORTHINGTON: The paper last mentioned is offered in evidence by counsel for the defendant.

1855 Mr. BIRNEY: Counsel for complainants objects on the same ground as heretofore stated in reference to the last paper offered.

The said paper is as follows:

Toronto, 1897.

Exchange revenue		189,591.98
Expenses:		
Operating	52,517.73	
Maintenance	38,624.05	
Material	17,067.53	
General	33,682.60	
Postage and Telegraph	634.57	
Taxes	1,891.34	
Legal	5.	
Depreciation	68,036.63	212,459.45
Loss		22,867.47

Toronto, 1898.

Exchange revenue		205,253.36
Expenses:		
Operating	52,702.01	
Maintenance	33,017.62	
Material	24,355.77	
General	34,583.56	
Postage and Telegrams	1,164.98	
Taxes	1,831.	
Legal	1,160.37	
Depreciation	71,153.83	219,969.14
Loss		14,715.78

1856 By Mr. WORTHINGTON:

Q. I will ask you, Mr. Sclater, whether the statements contained in the two papers just offered in evidence as to the business of the Toronto exchange in 1897 and 1898 are correct and true? A. They are correct and true.

Q. I would like to ask you particularly with reference to the allowance which you have made for each of these years for 10 per cent. on account of depreciation, and ask you how that is arrived at and how, if in any way, you have verified

it? A. In Toronto we commenced our construction in 1881, and we went on constructing, expending different amounts in different years, until 1895. At the end of 1895 we had completed a new system, and to be sure that it agreed with what we had in our books on account of *capital expenditure*, we had it revalued, and the valuation came then to $684,232. We then took the amounts that had been spent there year by year and took off ten per cent. each year and added the new construction; and the amount that it showed was, according to that, $701,707.62. Those amounts are so nearly correct that it confirmed what we had previously arrived at generally and in other places, that 10 per cent. was the proper amount for depreciation of telephone plants for that time.

Q. I observe that included in this statement of 1897 is an item of $17,067.53 for material. Is that material used in construction or in maintenance? A. In maintenance entirely.

Q. Then there is an additional item of $38,624.05 for
1857 maintenance. Do I understand that in addition to these items your statement shows that 10 per cent. must be allowed for depreciation annually? A. Yes.

Q. Will you explain what it is that is covered by depreciation which is not taken care of by the two items referred to for maintenance proper? A. Constant changes are taking place in the telephone business. When a telephone exchange has grown to a certain extent, the previous plant has to be gotten rid of and a new plant put up. A certain system of switchboards is not sufficient for the requirements of the larger office. They have to be taken out and thrown away, and a new system introduced. These are things that cannot be looked after year by year, but only at stated periods in the history of a telephone exchange, when a complete change has to be made, and the money has to be provided to make the change. What you find in our regular pay rolls for maintenance is simply general repairs to the system as it is then running. Beyond that there is the new construction that has to be done for an entire change of system—small poles taken down and big poles put up in their places, and finally big poles taken down altogether and underground work put in; and that, in our experience between 1880 and 1895, required an annual setting aside of 10 per cent.

Q. Have you prepared a statement showing your calculation allowing 10 per cent. depreciation for each year from 1881, in the Toronto plant, and arriving in that way at a valuation of the present plant of something over $70,-
1858 000? A. Yes.

The witness hands the statement last referred to to counsel for defendant, who offers it in evidence. Said paper is as follows:

	1881	40,900	40,900	
			4,090	
			36,810	
			12,455.57	
	1882	12,455.57	49,265.57	49,265.57
			4,926.56	
			44,339.01	
			14,771.67	
	1883	14,771.67	59,110.68	59,110.68
			5,911.07	
			53,199.61	
			21,756.91	
	1884	21,756.91	74,956.52	74,956.52
			7,495.65	
			67,460.87	
			20,145.75	
	1885	20,145.75	87,606.62	87,606.62
			8,760.66	
			78,845.96	
			49,109.70	
	1886	49,109.70	127,955.66	127,955.66
1859			12,795.57	
			115,160.09	
			40,129.15	
	1887	40,129.15	155,289.24	155,289.54
			15,528.92	
			139,760.92	
			33,863.98	
	1888	33,863.98	173,624.30	173,624.30

			17,362.43	
			156,281.87	
			54,832.37	
	1889	54,832.37	211,094.24	211,094.24
			21,109.42	
			189,984.82	
			81,158.21	
	1890	81,158.21	271,143.03	271,143.03
			27,114.30	
			244,028.73	
			127,022.82	
	1891	127,022.82	371,051.55	371,051.55
			37,105.15	
			333,946.40	
			176,831.46	
	1892	176,831.46	510,777.86	510,777.86
			51,077.79	
			459,700.06	
			170,633.77	
	1893	170,633.77	630,333.83	630,333.83
			63,033.38	
1860			567,300.45	
			146,283.76	
	1894	146,238.76	713,539.21	713,539.21
			71,353.92	
			642,185.29	
			59,522.33	
	1895	59,522.33	701,707.62	701,707.62

1861 By Mr. WORTHINGTON:

Q. In order that we may have a clear understanding of this statement, please explain the item for, say, 1881 and 1882 in the statement. A. The first column gives the year; the second column the amount of money that was ex-

pended in Toronto on construction account; the third column contains the calculation of 10 per cent. being deducted from that amount, followed by the amount of construction of the following year, and 10 per cent. again deducted from the total, and so on year by year until the end of 1895.

Q. When was an appraisement made showing the actual value of the Toronto plant to be $684,232? A. It was concluded on the 31st of December, 1895.

Q. As a matter of fact, did the expenditures which were made for new construction, to take the place of old construction, correspond from year to year with the figures arrived at by the 10 per cent. charged off in this theoretical estimate? A. They did not agree every year, but in lumps.

Q. Some years a great deal more, and some years practically nothing? A. Yes.

Q. Have you had any experience in keeping accounts of any other business than the telephone business? A. Yes; I was reared as an accountant. I was articled to a firm of accountants in England as long ago as 1867, and remained with them eight or nine years.

Q. In that way, what experience did you have in 1862 getting a knowledge of the accounts and bookkeeping of other businesses? A. I audited businesses of every description—banks, insurance companies and railways.

Q. How do the financial transactions and calculations affecting the operation of the telephone business compare with that of the other businesses with which you have had experience?

Mr. BIRNEY: Objected to as utterly immaterial.

A. It is the most difficult of any I have ever had any experience in.

Q. Why is it so difficult? A. Because of the constant change and the never ending of any one particular piece of plant. Every new subscriber is practically an increase to the construction account; and yet when you arrive at a certain stage you have to wipe a large portion or nearly all of it out, to replace it with something else.

Q. Something has been said here about the salary of your manager at Toronto, in reference to a $500 bonus. What can you tell us about that? A. It is not a bonus. His salary was increased to $3,000 a year, but in order that there should be no difference in the salaries of the two large managers, he only put on his own pay roll the $2,500, and we sent him direct from here the $500 extra.

Q. Why is it that if your company has been doing business at a loss in Toronto, the rates have not been raised since the expiration of the agreement between the

1863 company and the Toronto authorities, made in 1892?
A. On account of the uncertainty as to our ability to increase them under the amendment to our charter, 55-56 Victoria, Chap. 67, which is as follows: "The existing rates shall not be increased without the consent of the Governor-in-Council."

Q. It has appeared in evidence in this case that the rates charged by your company in Toronto under the agreement in question were $45 for business and $25 for residence telephones. It has also been shown that the market price of the stock of the company is largely above its par value. Will you tell me what explanation there is of this fact? Why is it that if the company is doing a losing business in Toronto, its stock is worth 180, or thereabouts, when the par value is only 100? A. I really cannot answer why stock should be at that height, because I remember when, although paying the same dividend, it was under par; but presumably it is based on the dividend of the company, which is 8 per cent. per annum and has been for some years past.

Q. What business does the company transact which enables it to pay a dividend if it is doing business at a loss in Toronto? A. The long distance business is the chief item.

Q. Does the company have all the long distance business in Canada, or the bulk of it? A. All in the territories covered by its exchanges. No other company's lines con-
1864 nect with our exchanges.

Q. Then the territory covered by your long distance lines is what? Give the boundaries of it. A. The provinces of Quebec and Ontario, I may say.

Q. Does the company do its own manufacturing in part? A. It used to. It does not now.

Q. How long since it ceased to manufacture its own apparatus? A. Two years.

Q. I understand that it is now a shareholder in the company which does the manufacturing? A. Yes.

Cross-examination.

By Mr. BIRNEY:

Q. Does the Bell Telephone Company of Canada issue annual reports or statements of its business? A. To its shareholders.

Q. Are those reports printed? A. They are always printed; yes.

Q. Have you copies of them convenient in the office? A. Yes.

Q. I will ask you to produce such printed reports as you may have.

By Mr. WORTHINGTON:

Q. Before you respond to that request, do those reports show anything in relation to the Toronto business by itself? A. No, not separately.

1865 Q. Simply the general business of the company as a whole? A. Yes.

Mr. WORTHINGTON: Then I object to the question and request, on the ground that it has nothing to do with the examination in chief. If counsel for the complainants desired such evidence, he should have made it a part of his case.

By Mr. BIRNEY:

Q. Do not those reports or statements include the Toronto business? A. Part of the whole business of the company is Toronto, but it does not show that separately.

Q. That business does appear in the statements? A. No. The details of it are there, but it does not appear at all on the statement.

Q. Not as Toronto business, but it in fact enters into the accounts? A. Not apparently. You would get no Toronto information whatever by looking at that statement.

Q. And yet it is true that the Toronto business is contained within the aggregate statements found in that report each year? A. It is a small portion of the whole.

Q. I ask that you produce those statements.

By Mr. WORTHINGTON:

Q. Mr. Sclater, what response do you make to that

1866 request? A. I am not authorized to give the statements to anybody but the shareholders of the company, without the order of the Court.

Q. Do I understand that you decline and refuse to produce them? A. Without an order, yes.

By Mr. BIRNEY:

Q. I now show you a printed paper entitled "The Bell Telephone Company of Canada, 1897," purporting to be signed by Chas. F. Sise, President, and Robert Mackay, and I ask you if that is a printed copy of the report of your company for the year 1897? A. I have no doubt it is.

Mr. BIRNEY: I offer in evidence the paper just identified by the witness.

Said paper is filed herewith, marked Exhibit Sclater No. 1.

By Mr. BIRNEY:

Q. You have for several other years, both before and since

that report was made, similar reports, have you not? A. Yearly. The report is submitted to the shareholders yearly.

Q. From what sources did you make up the statements of the Toronto business as to which you have testified in chief? A. From the records of this office.

Q. Are those papers copies of records in your office, or are they the result of compilations made by you or some other person? A. They are extracts from the figures; they
1867 are copies of the figures referring to the place.

Q. Do your records contain documents exactly similar, word for word, to these? A. No; the 10 per cent. depreciation is distinctly stated there as being added.

Q. Except for that, do your books contain the originals of these documents? A. Exactly.

Q. Will you please produce them for my examination? A. That I have no authority to do. The point has been presented in previous cases. Without an order, either from the Board of Directors or the Court, I am not allowed to produce books. I am the custodian, but not authorized to produce them.

Q. And you decline to produce the books? A. Without an order.

Mr. BIRNEY: Counsel for complainants gives notice to counsel for defendant of his desire to examine the books from which these accounts are said to be made up, and demands their production.

Mr. WORTHINGTON: Counsel for the defendant join in the request of counsel for the complainants, and ask the witness to produce the books, and allow counsel for complainants to examine them.

The WITNESS: I am unable to produce them without an order, as I say, from my directors or the Court.

1868 By Mr. BIRNEY:

Q. Those books are in the building in which this testimony is being taken? A. Yes.

Q. They are in your custody, are they? A. They are in my custody.

Q. Does your refusal to produce the books asked for extend to the books in which would be shown the items contained in the paper produced by you, containing the itemized expenses of the Toronto business for 1897 and for 1898? A. It refers to all the books of the company.

Q. By whom was this paper last referred to made up? In whose handwriting is it? A. The chief clerk's.

Q. What is his name? A. Mr. Slack.

Q. What part had you in making it up? A. None whatever, beyond telling him to make it from the accounts.

Q. Do you know what material he used in making it up? A. The books.

Q. Do you now what particular books? A. The agency journal.

Q. Anything else? A. No; it would all be there.

Q. From what is the agency journal made up? A. From the agent's statements, the head office returns and the storekeeper's expenses.

Q. It is not a book, then, of original entry? A. It
1869 it, as far as the Toronto local manager's statements are concerned. They are copied into the agency journal. The other entries come from the storekeeper's books or from the Ontario department returns.

Q. Why do you refuse to allow me to see the books containing these accounts? A. Because I am not entitled to let you see the books in my possession. I am the custodian only, subject to the orders of my directors.

Q. Have your directors forbidden you to produce the books at this examination? A. No; but they have not authorized me to do so.

Q. Have you had any communication with the president of the company upon the subject? A. In case they were demanded, I asked if the Board had any instructions to give me.

Q. And what was his answer? A. None.

Q. Are you able to say of your own knowledge what items entered into this general item of operating $52,702.01 in 1898? A. Yes; the operating is all the expenses in connection with operating the switchboards.

Q. What items entered into the general item of maintenance? A. Maintenance, and nothing but the wages of the people not on the operating staff and not on the costruction staff—inspectors and repairers, and a proportion of the clerical force—the proportion that is not operating.

1870 Q. In maintaining your plant you seek to keep it up to the same degree of efficiency each year? A. It has to be kept in good working order all the time.

Q. And you make good other repairs—any defects which develop themselves during the year? A. Simply repairs. Enlargements go to construction account.

Q. To what account do you charge the subscribers' equipment? A. Construction. Originally all equipment is construction.

Q. The material account, I suppose, covers the material purchased for the use of the repairers? A. Yes.

Q. Does it extend to any construction items? A. Not new construction; no. The material there is the maintenance material and not construction material.

Q. What items enter into the general expense, as found in this paper? A. They include the departmental offices and the head office charges and legal expense—all things that are paid here for the general benefit of the company and not for any individual place.

Q. Does it include dividends? A. No; of course not.

Q. Have you any bonds outstanding of the Bell Telephone Company of Canada? A. Yes.

1871 Q. To what amount? A. Nine hundred and some odd thousand dollars.

Q. What interest is paid upon them? A. Five per cent.

Q. Does that enter into this? A. No; bond interest is a separate charge entirely. It does not go into the expenses of the company.

Q Then this item of general expenses has reference to the central office expenses at Montreal? A. Not the central office, the general office, the head office, including the engineering department generally of the company, the stores department generally of the company, including the branches like Hamilton, which you heard of, the Ontario department, a distributing place, which is simply a branch of the head office.

Q. I understand you to charge all reconstruction to maintenance. Is that right? A. No; only such portion of reconstruction as is not an increase. For instance, if we take down a line of long poles, we charge the increased cost over and above what the original ones had cost to construction; and maintenance has to take charge simply of what was there before—the old part.

Q. Suppose you put down a line of greater capacity than a line which you had before, covering the same district. How would you charge that? A. We would only charge to construction the increase over the cost of what had already been charged to construction account.

1872 Q. In spite of the increased capacity of the line? A. Increased capacity of the line makes the construction value greater when it is made up to the proper capitalization value of that line.

Q. As to this item of depreciation, which is a large one in both these statements, as I understand you, that item is made necessary, under your theory, through the improvements which are made in the art of telephoning and in the equipment necessary to keep pace with the improvement of the art, whereby a plant which has been kept in a good condition of efficiency is thrown away and rejected. A. Partly. Not necessarily improvements, but changes necessitated by increased growth, or improvements.

Q. Does your company lay aside any reserve fund? A. Yes.

Q. Under what system? A. Under a system as nearly as possible based on proportion, less what has been spent on that particular year. We call it contingent fund.

Q. How is that proportion reached; by percentage? A. It is arrived at by a fact, more than anything else. That is to say, in any given year we find that construction account has been so much, revenue account has been so much, but out of the construction expenditure the proportion is greater than the revenue of the year can stand; so then we have to lay a portion of it off to contingent fund.

Q. Does that contingent fund enter into this item of general expense? A. No, not at all, excepting the 10 per cent
1873 would practically be what Toronto should provide for that contingent fund in any one year, to provide for the contingencies which will come, inevitably—that have come in the past and must come in the future.

Q. When was your plant in Toronto reconstructed? A. The reconstruction was accomplished in 1895. It took two or three years to do.

Q. Was not that reconstruction and consequent expense due in large measure to the great increase in the number of telephones? A. Part of it was primarily due to a contract which was made between ourselves and the city that we would put in a metallic circuit system, with underground wires, in the central part of the city.

Q. That has been accomplished? A. That has been accomplished, as far as it was called for.

Q. The number of telephones increased from 2,969 in 1889 to 5,932 in 1898? A. Yes.

Q. Is it your supposition that the increase in the next ten years will be as great? A. It would be utterly impossible for me to say.

Q. You have no theory upon that subject? A. No; we assume the business will grow, but it is only assumption.

Q. Do you assume it will grow to that extent? A. Really I cannot give a rational answer to such a question. I am not a prophet.

1874 Mr. WORTHINGTON: I must object to guesses. We are guided here by the lamp of experience.

By Mr. BIRNEY:

Q. Your company has paid yearly dividends, at the rate of 8 per cent, I think you said? A. For some years past, yes.

Q. Before that, at what rate? A. 7, 6 and nothing.

Q. For how many years has it paid dividends unbroken?

Mr. WORTHINGTON: I object to all these questions about

the general business of the Bell Company of Canada, on the ground that the only thing in question here is the past experience of the company in the city of Toronto.

A. Nine or ten years uninterruptedly.

Q. Has it, in addition to the money dividends, as you have given them, also paid stock dividends? A. Never.

Q. Has any stock been divided among the stockholders? A. Never.

Q. Or the proceeds of any stock? A. No; the only stock of the Bell Telephone Company of Canada issued has been issued to shareholders at par for money.

Q. Was there no division of stock among the shareholders in 1898? A. No.

Q. I have in my hand an official document, No. 403, entitled "Advance Sheets of Consular Reports," in which ap-
1875 pears a statement over the signature of W. M. Sewell, U. S. Consul at Toronto, in which he says—

Mr. WORTHINGTON: Before you finish that question I want to interpolate my objection to counsel seeking to put in evidence, in the form of a question, an unproved, unauthorized, unreliable statement by some unknown person, upon the ground, among other things, that the witness now testifying through the counsel has not been sworn and we have had no opportunity to cross-examine him.

Q. In which he says:

"During the year 1898 there were divided among the shareholders at par 729 shares of new stock, in the proportion of one of new to four of old, all of which, with the exception of 160 shares, were sold at a premium and divided pro rata."

A. No; it is entirely wrong. The 7,920 shares were offered to shareholders at par in the ratio of 1 to 4. They were all taken by those shareholders at par with the exception of 160 shares. Those 160 shares were sold, and the premium was divided among those shareholders who had not applied for their proportion of new stock. This statement here is entirely wrong. The premium was not divided pro rata.

Mr. BIRNEY: Counsel for complainants here gives notice that he will move to strike out from the record the statements of the witness showing the receipts and expenditures, for the reason that the sources of information, to wit, the books, have
not been offered, and there has been a refusal to exhibit
1876 them.

Redirect examination.

By Mr. WORTHINGTON:

Q. In the statement which you have put in evidence showing the revenue and expenses of the Toronto business for 1897 and 1898 has anything been included which relates to construction? A. No.

Q. You have said that the installation of a subscriber's equipment is charged to construction originally? A. Yes.

Q. What happens when the subscriber gives up his telephone, so far as the book entries are concerned? A. The instrument is taken out and used probably for another, without any increase in the cost of construction; but what is lost there is the inside wiring. The same instruments may be used or others may be used in place of them.

Q. How do you keep your accounts straight? A. The construction account is charged with the total number of sets of instruments that are in use in a given place; and they have their stock of things, which they are also charged with; but so long as they can go on using the same instrument without any increase, there may be a transfer from one place to another, and there is no extra charge to construction. It is practically treated as a removal, so far as construction is concerned.

Q. But what do you do with the loss from the wiring 1877 inside? A. That becomes a charge and is lost.

Q. Does that still stand to construction? A. There is no more charge to construction. The changing of an instrument from one house to another, although there is a certain amount of new construction in it, is not new construction, because it is practically the same plant as it was before, although it is not in the same place. The wiring inside of a man's house is lost, because when he gives up a telephone we cannot take it out and do anything with it. It is simply lost, and revenue account has to stand that.

Q. Then does not your construction account show more than it should? A. No; construction account remains correct.

Q. You have been asked about the general affairs of the Bell Telephone Company in Canada and the annual report to the stockholders for 1897 has been forced into the case. I see by that statement that the value of the plant and patents of the company on the 31st of December, 1897, is stated to be $4,395,548.88. What was the amount of the outstanding shares of the company at that time? A. The stock issued at that time was $3,168,000.

Q. So that your plant really represented then a good deal more than your stock? A. More than our stock; but you will also notice there is $940,000 of bonds.

Q. And the stock and bonds together practically equaled the value of your plant and patents? A. Yes.

1878 Q. Are you able to tell me how much of that sum is made up of the patents? A. About $450,000.

Q. In this statement it appears that your receipts from the long distance lines in 1897 amounted to $229,917.98. I find nothing in this statement to show what were the expenses on account of the long distance lines. Can you tell me what they were? A. Yes; they are practically 25 per cent of the whole.

Q. 25 per cent of the gross expenses? A. No; 25 per cent of the long distance revenue is chargeable to the working expenses of long distance revenue; that is to say, taken from the expenses of its agencies.

Q. Then 75 per cent of it was profit? A. Yes.

Q. Does this statement include anything as to the profits made by the company on account of manufacture and sale of apparatus? A. Is that 1897?

Q. Yes. A. It includes the sale, not the manufacture. They were manufacturing only for a month or two in 1897.

Q. In your books are the financial transactions of the Toronto exchanges kept separate from the other exchanges, or are they mingled with the other entries? A. They are generalized with all the others. The whole of the six hundred

1879 or seven hundred agencies are journalized one after the other.

Q. So that an inspection of the entries relating to the Toronto business would require exposure of the rest of your affairs? A. Of the rest of the business.

Q. I will ask you whether or not, before you were sworn as a witness here, both yesterday and today, counsel for defendant in this case did not urge you to produce the books if they were asked for and exhibit them to counsel on the other side? A. You asked me to; yes.

Re-cross examination.

By Mr. BIRNEY:

Q. When did the Bell Telephone Company of Canada become the owner of the stock of the Northern Electric Company? A. In 1897.

Q. At what cost? A. Par.

Q. And that means how much in dollars? A. 93 per cent of $150,000—$139,500.

Q. The total stock being $150,000? A. Yes.

Q. Does that amount appear in the statement of 1897 shown you? A. Stock of other companies, yes.

1880 Q. What amount was conducted to your contingent fund in 1898? A. Nothing.

By Mr. WORTHINGTON:

Q. You have said that the stock of the manufacturing company cost the Bell Company something over $139,000? A. Yes.

Q. Did not the Bell Company own the manufacturing plant and turn it over to the new company in exchange for the stock? A. No; they rent that to them.

Q. Did the Bell Company actually pay to the manufacturing company the $139,000? A. Yes; they actually paid them the $139,000. They handed over the material that was on hand at its valuation, which was a cash entry. The plant itself is rented. The manufacturing material and things in course of construction were sold to them, but it was a cash invoice. It really was actual cash.

Q. What is the amount of the material which was turned over to the company? A. About that time about $80,000 or $90,000.

Q. And the rent was paid in actual cash? A. Yes.

Q. And they still own the manufacturing plant, which they rent to the new company? A. Which they rent to the company.

CHARLES PAGE SCLATER.

Signature affixed by the Examiner, by consent of counsel.

1881 The further taking of these depositions was thereupon adjourned until Monday, June 5th, 1899, at —— o'clock, at the city of Detroit, Michigan.

1882 Cadillac Hotel, Detroit, Michigan,

Monday, June 5th, 1899, 10 o'clock a. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney.

Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

James Beamer, a witness of lawful age, called by and on behalf of the defendant, having been first duly sworn, is examined

By Mr. WORTHINGTON:

Q. Mr. Beamer, where do you reside? A. Detroit.

Q. What is your age? A. Fifty-three.

Q. And your occupation? A. I am not doing anything just at present.

Q. Have you been at any time connected with the Michigan Telephone Company? A. Yes, sir.

Q. In what way? A. In different capacities. I started in as a lineman first about eighteen years ago, and from that to foreman. For the last thirteen years I have been superintendent of their construction.

Q. Up to what time? You say you have no employ-
1883 ment now. A. The 24th of March.

Q. The 24th of March last? A. Yes, sir.

Q. I believe the affairs of that company passed under new management in March last? A. In February; yes, sir.

Q. Then you were the superintendent of construction of the company for the thirteen years immediately preceding last March? A. Yes, sir.

Q. What territory do that company's operations cover? A. The whole State of Michigan.

Q. How many exchanges? A. In the neighborhood of 80, or something like that.

Q. Does it also operate long distance lines within the State? A. Yes, sir; that is, the lower peninsula. The upper peninsula is not wired much for long distance—not to speak of.

Q. But it has the intercommunicating lines of its own exchanges? A. With the exception of the upper peninsula, and two or three cases in the lower part. Alpena, for instance, is not in communication with the rest of the State, and some other minor exchanges.

Q. What are the largest exchanges operated by that company, and give about the number of subscribers in each at the time you ceased to be connected with the company?
1884 A. Detroit had in the neighborhood of 5,000. Grand Rapids will come next, with about 1,200. Saginaw, about 700; Jackson about 500.

Q. Did you have anything to do with the construction of the Michigan Company's plant here in Detroit? A. The reconstruction.

Q. Was it reconstructed under your direction and supervision? A. Yes, sir.

Q. When? A. In the last thirteen years we have done it at different times. That is, we never put a great deal of new material in it; we just simply fixed it up.

Q. During that thirteen years did you have anything to do with the maintenance of the company's plant? A. Yes, sir.

Q. You had charge of that also? A. I had charge of that also.

Q. Did your duties extend to the financial part of the business? A. No; not any more than to take care of what men I had employed.

Q. How many exchanges did the company have here in Detroit at the time your connection with it ceased? A. Sub-stations, do you mean?

Q. Yes; how how many exchanges, all told, in Detroit? A. Three.

Q. What is the principal exchange called? A. Central station.

1885 Q. How many of the 5,000 subscribers did it have? A. It had about 4,500.

Q. The remaining 500 were divided between the other two? A. Yes.

Q. How long had those two sub-stations been in operation? A. A little better than a year. The largest one is Woodward Avenue North station.

Q. What is the average distance from the central exchange of its 4,500 subscribers? A. I gave you the average distance awhile ago as a whole; but, putting it that way, I don't think it would be as much—probably not to exceed a quarter of a mile.

Q. What was the average distance of the remaining 500 subscribers from their respective exchanges? A. It would be a good deal more than that. I couldn't say. They are very long lines—probably a mile.

Q. Is the plant of the Michigan Company in Detroit overhead or underground? A. Both.

Q. What is the extent of the underground part of the plant? Is there any area within which it is required? A. The ordinance calls for a mile limit, a mile circuit. That is, a half mile each way.

Q. A half mile radius from what? A. From the City Hall.

Q. Within that radius, is the whole plant under-
1886 ground? A. With the exception of distributing poles and alleys for blocks.

Q. What is the system of distributing wires from the conduits? In such blocks of office buildings as the Hammond Block, or the Board of Trade, we run an independent cable to those buildings. For office buildings where there is a number of telephones the balance of the block is taken care of by a distributing pole in the alley.

Q. Have you any undegruound conduit outside of that mile circuit? A. Yes, sir.

Q. How much? You understand, of course, I am speaking of the situation at the time you ceased to be connected with the company. A. There has been nothing built since then to speak of. I should say one-third of it is outside.

Q. Then what is the proportion between all your conduits and your overhead lines? What proportion of all your wire mileage is underground? A. I should say that there is more underground than there is overhead. How much the difference is I couldn't tell. They have got it there at the office. They have got that all figured out, on account of taxation.

Q. Was that underground conduit laid on streets that were paved? A. Yes, sir.

1887 Q. What kind of paving? A. Generally cedar block on sand—gravel.

Q. Was any of it asphalt? A. No; with the exception of where we would have to cross a street, or something of that kind.

Q. Did you have to take up the pavement and relay it? A. We didn't relay it. The Board of Public Works relaid it—that is, where there was any good pavement. Of course, where the street was to be paved soon after we laid our conduit it was just simply laid back temporarily.

Q. Then as a general thing did the Telephone Company have to be at the expense of relaying the pavement? A. Yes, sir.

Q. In what proportion of your underground conduit work did the Telephone Company relay the pavement, and what proportion was done by the city? A. It was all paid for by the Telephone Company.

Q. Were there some cases in which the city was repairing streets? A. It would simply be in such cases where they were going to repave the street with the modern class of pavement, with concrete foundation. That street would simply be laid back—the pavement laid in temporarily—and they would usually come on within a few weeks afterwards and do the work.

Q. In that case would the city or the company pay for the paving? A. We paid for it; we put it back ourselves.

Q. The improved pavement? A. No; the old pave-

1888 ment.

Q. The improved pavement would be laid by the city? A. Laid by the city. Of course, none of that charge would come against the company.

Q. About what was the cost of that underground work, per duct foot, say? A. Our estimates were 20 cents per duct foot. It varied from that. It ran from 15 to 20 cents.

Q. Could you say whether or not 20 cents would be a safe average?

Mr. BIRNEY: Objected to as clearly leading.

A. I think so.

Q. What did your manholes cost for that underground work? A. Generally, on what we called straightaway work, not special work, about $45. We did get manholes that cost $100 in special cases, at the corners of streets, or large leads, or something like that.

Q. What did the covers of those manholes cost? A. About $13.

Q. When you say $13 for the cover do you mean the $45 includes the cost of the cover? A. Yes, sir.

Q. What kind of poles do you use in your overhead construction? A. In general?

Q. Yes; what kind of wood? A. Cedar.

1889 Q. What is the height of the poles? A. They run from thirties to fifties; in some cases fifty-fives, and a few sixties.

Q. Does that mean the entire length of the pole? A. Yes, sir.

Q. About what would you say is the average height of all your poles? A. I should say about forty feet.

Q. How much of that would be in the ground? A. Five feet.

Q. About what do those poles cost you set in the ground ready for cross-arms? A. Average cost?

Q. Yes. A. About $4.

Q. Does that include the cost of the pole? A. No, sir.

Q. What was the average cost, including the cost of the pole and the cost of setting it in the ground? A. I should say it would be in the neighborhood of $8.

Q. Can you tell us whether the cost of a pole increases as its height increases, in the same proportion to the height or greater? A. Yes, sir; it would increase not so much necessarily in the labor, but the poles cost more money.

Q. For illustration, what would be the cost of a 70-foot pole as compared with the cost of a 40-foot pole—the original

1890 cost of the pole? A. The 70-foot poles cost us about $20.

Q. Not including the cost of setting? A. No, sir. We had some, but they were Norway pines. We couldn't get cedar of that length. They were set on Griswold street here, and cost about $22. That is, the pole without any labor. The labor would probably be as much more.

Q. How many cross-arms do you carry on your poles? A. We carry as high as ten; in some cases eleven and twelve; not very many such cases as that, though—it is generally from eight to ten. In the last few years we are limited over railroad crossings to eight cross-arms—eighty wires.

Q. What was the maximum number of wires that you carried on poles before that? A. We carried as high as 200.

Q. How many cross-arms did you have for 200 wires? A. 10.

Q. That would be 20 wires for each cross-arm? A. 20 wires to each cross-arm.

Q. How would they be attached to the cross-arms? A. An additional wire would be attached under the arms to a porcelain knob.

Q. What kind of insulators would you use for the wires on top of the arms? A. Glass.

Q. Do I understand you would have 10 wires on the top of the cross-arms, with glass insulators, and 10 below, with porcelain insulators? A. Yes, sir.

1891 Q. Do you carry any aerial cables on your poles? A. Yes, sir.

Q. Does the maximum number of wires to the pole that you have given us include aerial cables? A. No, sir.

Q. How many wires would be added in cables to this load of 200 wires to the pole? A. In some cases 300 wires. There might be a few cases where there were more than that.

Q. Do you consider that good construction to have poles of that size carry so many wires? A. No, sir.

Q. Why was it done? A. The financial part of the company didn't have money to do it any other way.

Q. What kind of circuits did you give your subscribers? A. Until within the last two years it has been the grounded service, with the exception of cases where parties have paid the additional rate.

Q. During that period when you had the grounded service what sort of transmitters did you use? What sort of instruments? A. Blake.

Q. What kind of wire? A. Generally 14 steel.

Q. What kind of service did that sort of equipment
1892 give? A. Very good, at times. In the last year it gave no service at all in the underground service.

Q. Why? A. Because of electric disturbances from street railway and lighting plants.

Q. Within the last two years what kind of service have you furnished your subscribers? A. Most everything was metallic or quiet line system, as they call it. It was simply a metallic line, but they call them quiet lines.

Q. Does that furnish each subscriber a complete independent metallic circuit, or do you use the common return? A. There has been a common return used.

Q. How was it at the time you left the company's employ last March? Were the common returns used then? A. They were discontinuing them as fast as possible.

Q. Why? A. On account of the poor service—the noisy line.

Q. Is the metallic circuit which the company was giving the subscribers the steel wire you have spoken of? A. Yes, sir.

Q And the Blake transmitter? A. The Blake transmitter.

Q. You have spoken of an extra charge made where better equipment was furnished. What was that better equipment and what was the charge? A. Long distance service; usually copper wire.

Q. What form of telephone? A. Long distance equip-
1893 ment.

Q. What is that? A. It is a different form of telephone—a better talking telephone.

Q. Is it what is known as the solid back? A. The solid back; yes.

Q. What rate was charged where a subscriber was furnished with a metallic circuit of copper and a long distance solid-back telephone? A. I wouldn't like to put down figures on that. It is in the neighborhood of $100; but the first charge here was the added mileage. A portion would come inside of the mile, and outside of the mile there would be a mileage added to that. But the last year and a half they have not used the mileage anywhere in the city.

Q. They have not used it? A. They have not used it. They will give you a rate anywhere in the city the same; that is, with the Blake transmitter. I won't be so sure about that with the solid back.

Q. Mr. Beamer, could you tell us, from your knowledge of these things, how much more the underground conduit here would have cost than it did if you had had to lay it under streets paved with asphalt and repave them yourself?

Mr. BIRNEY: I object to that question unless it appears that the witness has heretofore made definite and certain calculations.

1894 A. I should say about 10 cents per duct foot.

Q. You mean that would be the total cost, or the additional cost? A. The additional cost. That would make it about 30 cents. I am speaking about Detroit, when I am talking about this. At other places it has not cost us so much.

Q. How does the cost of erecting a telephone plant now compare with what it was two years ago, say. A. I should say it would be one-quarter greater.

Q. Why is that? A. The increased price of material and labor.

Q. Are you familiar with the plant of the Michigan Telephone Company at Grand Rapids, Michigan? A. Yes, sir.

Q. How did you acquire that familiarity, Mr. Beamer? A. I had charge of the work of construction and reconstruction. That is, I did not construct the plant at first, but I have had charge of it since, remodelling it and putting in the underground system.

Q. How many exchanges has the Michigan Telephone Company in Grand Rapids? A. Only one at that time.

Q. What was the average distance of the subscribers there from the central station? A. About a quarter of a mile was the average.

Q. Was the plant overhead or underground? A. Both.

Q. What proportion of each? A. Most of the telephones are underground.

1895 Q. Of course you do not mean the telephones are underground? A. The lines are underground.

Q. Have they been under ground recently, or when? A. I think five years ago they were put underground.

Q. What proportion of their entire plant is underground and what overhead? A. Now?

Q. Yes. A. I should say two-thirds of the plant is underground.

Q. Were those underground conduits in Grand Rapids put under asphalt paved streets, or what kind of pavements? A. In some cases under asphalt, and some brick. The majority of them were put down under the block pavement.

Q. What proportion under asphalt; any considerable portion? A. No, not very much; probably not greater than a thousand feet of trench.

Q. How do the average pole lines in Grand Rapids of the Michigan Telephone Company compare with those you have described here in Detroit? A. About the same.

Q. What is the total extent of the underground conduits in Grand Rapids of the Michigan Company? How would it be in trench miles? A. I should say they would have between seven and eight miles of trench there. They might possibly have more. They have got about 225,000 feet of duct there. The ducts run from 4 to 10 in a trench.

1896 Q. What kind of circuit is given the Michigan Telephone Company's subscribers at Grand Rapids; grounded, common return, metallic, or what? A. Grounded service. As far as the metallic is concerned, it has been paid for extra there; but in the last year they have had to do the same we we are doing here.

Q. Change to metallic? A. Yes, sir.

Q. What kind of wire do they use? A. Generally 14 steel.

Q. Do you know whether or not, if a subscriber in Grand Rapids has a copper wire, metallic circuit, long distance telephone, he pays extra for it? A. He pays extra for it.

Q. Do you know what the rate is there for that sort of service? A. I do not.

Q. Are you sufficiently informed as to the financial part of the business to know whether or not the rates charged by the Michigan Telephone Company in Detroit and in Grand Rapids are remunerative? A. I would not know, sir.

Q. That would not come within your cognizance? A. No, sir.

Q. Are you a stockholder in the company? A. No, sir.

Q. You do not know, then, of your own knowledge, whether

it has been paying dividends or not? A. Only by hear-
1897 say, that is all.

Q. Do you know anything of the plant of what is called the opposition company in Detroit, the Detroit Telephone Company? A. In a general way.

Q. How did you get your information as to that plant? A. By observation, when they were putting their work down—when they were doing the work.

Q. What kind of work have they done with their underground construction, so far as it came under your personal observation? A. I never thought very favorably of it.

Q. Describe it, please, Mr. Beamer. A. In laying their conduits, they simply laid them in the ground, in the trench, and put some mortar in between the conduits, the same as you would lay brick, not in sufficient quantities to answer the purpose as it should. In a great many cases they broke down. They are six feet in length, and very crooked, some of them.

Q. Did you notice whether they used any concrete grouting to protect their conduits? A. I never noticed any. They might have in some few cases, where they had a wet hole, or something like that, and couldn't fill it up with earth. Then they might have used concrete.

Q. Were you here in the city when they were constructing their underground conduits? A. Yes, sir.

Q. How long were they about it? A. Nearly a year.
1898 They commenced in the summer, and they worked all winter. We had an open winter here, and they worked all through the winter.

Q. You were here all the time, were you? A. Most of the time. Of course I occasionally took a trip out through the State.

Q. I want to find out to what extent you saw their work, so that you could tell us in a general way what it was. Could you give us some idea of the extent to which you observed their underground work as they were going on with it. A. It was about all in that same condition.

Q. How do you know some of it broke down from want of sufficient protection? A. From observation and from talk with the men who had charge of putting in the cable.

Q. As to their pole lines, how do their pole lines in Detroit compare with the Michigan Company's pole lines? A. Their pole lines, of course, are new.

Q. I am not speaking of the age, but the method of construction, the height of the poles, the number of wires carried, and so on. A. I don't see that there is any particular difference, as far as that is concerned. Both are overloaded. They have probably got higher poles than the Michigan Company—a good many more higher poles.

Q. Can you give me any illustration of places in their lines where the poles are overloaded, and refer to particular localities? A. I could; yes.

1899 Q. Specify one or two, so that we may know just what you refer to. A. There is one case out parallel with Graciot Avenue a ways.

Q. What is the height of the poles on that line? A. They start in about 60's.

Q. And as they go farther, do they diminish in height? A. Yes.

Q. They come down to about what? A. I don't think there are any less than 45's, unless possibly out on the far end.

Q. How many cross-arms do they carry? A. They start in, I think, with 10. In some cases there are 12 on them.

Q. How many wires to each cross-arm? A. As a general thing, they only use 10. Their cross arms are a great deal closer together than what the Michigan arms are. They are about 14 inches apart; but in a great many cases they have got wires as well under the arm.

Q. Porcelain knobs underneath? A. Porcelain knobs underneath.

Q. Why is it that the porcelain insulator is used on the under side of the arm, and glass on the upper side? A. It is the only insulator, practically, for that purpose.

Q. How does the porcelain insulator compare with the glass? A. It is just as good. There is a difference in

1900 the shape of it; that is all.

Q. Is there any difference in the price? A. I think there is; yes. The porcelain costs more money, according to the size.

Q. I suppose there are insulators of both kinds, of different prices? A. Yes.

Q. On this pole line we have spoken of, of the Detroit Company, are there any aerial cables in addition to the wires? A. Yes, sir.

Q. How many wires are carried in the cables on that line? A. There is one cable, I know that has got one hundred pair in it; that is, 200 wires.

Q. What is a fair and proper load for poles averaging 50 feet in height; how many wires? A. If I was going to put up any new work, I shouldn't put up to exceed 50 wires.

Q. Why? A. Because of the difference in building now and when the lines were built. We have learned a great deal, you might say, in building lines. It would be policy, where there was any number of wires on a pole, to put them in cable form, and make any addition in cables instead of aerial wires, on account of less interruption from storms and otherwise.

1901 Q. Have you had any experience in Detroit with the effect of severe storms on overhead plant? A. Yes, sir.

Q. What was it? A. Sleet and snow storms are the most trouble here.

Q. Can you give us any special instance of that? A. Last November.

Q. What happened then? A. We had two lines go down here, heavy loads. It was aerial construction, that is, wire construction, almost entirely. There was one cable on each line that went down; but the lines were practically overloaded, was the reason they went down.

Q. What was the length of those lines? A. About two miles each.

Q. To what company did those lines belong? A. They belonged to both companies. I am speaking more of the Michigan Company, though.

Q. The two lines of wires you speak of belonged to the Michigan Company? A. There were about four miles of lines belonging to the Michigan Company that went down.

Q. How many belonging to the Detroit Company? A. I should say they had about in the neighborhood of three miles. They didn't have it quite so bad.

Q. Poles and wires and everything went down in the storm? A. Their poles were generally turned out by the roots. They were not in the ground very deep. They
1902 were tipped out.

Q. Mr. Beamer, what kind of distributing poles does the Michigan Company use here in Detroit? A. The Michigan Company has used cedar poles, about 45 and 50 feet. There are one or two cases where we have got 60's.

Q. How about the Detroit Company's distributing poles in the city? How do they compare with those of the Michigan Company? A. They are very much shorter. They use 30's, 35's and 40's. I don't know whether they have got any 45's and 50's. They may have some, though.

Q. How many wires are distributed from those poles? How do they run? A. In some cases there are sixty wires.

Q. Those distributing poles are usually in the alleys, are they? A. Usually.

Q. Then these 60 wires run in all directions from those poles? A. They generally set a pole in one end or the other of the alley, and set a few other poles to lead from those.

Q. Are those distributing poles equipped with the ordinary cross-arms? A. Yes, sir.

Q. Are you familiar with the style known as the Tower rings style of distribution? A. I have seen it; yes. We
1903 never did any of that here.

Cross-examination.

By Mr. BIRNEY:

Q. As I understand you, Mr. Beamer, you regard it as better construction now to carry your wires in cables than separately? A. Yes, sir; where there is any number on the pole.

Q. When you rebuilt the lines which were broken down in the storm of last November, did you use the cable, or separate wires? A. We used the cable.

Q. Can you carry more wires upon an aerial line when they are put in cable than you can when they are separate? A. Yes, sir.

Q. How many wires do you think it would be all right and good construction to put upon such a pole line as those that were broken down last fall? A. We figure to put as the limit 4 50-pair cables on such a pole line, and not put to exceed 50 wires on any one pole in such construction.

Q. You mean, then, you would carry 4 50-pair cables and 50 additional separate wires? A. Probably in cases there would be that many wires. The construction would be different. At points, say, for block distributing, there would be one cable in the four would come out. We would have a box so that we could go into that cable at that point. The idea was to not have the wires run any distance aerial from the telephone—to make the distance as short as possible. In any case there would probably not be 50 wires on the pole, but we could go to that extent if we wanted to. That was the limit.

1904

Q. That is good construction, it is? A. That is supposed to be the best construction at present.

Q. Have you ever made any calculations to determine the average distance from the central office of the subscribers who connect with the central switchboard in Detroit.

Mr. WORTHINGTON: Of what company?

Mr. BIRNEY: Of the Michigan Company.

A. I can't say that I have to give a good close answer to that; but it is known, of course, officially in the office. We have to make returns to the State for taxation purposes, and they have got that estimate.

Q. Who has that estimate? A. They have it in the central office.

Q. You have not that estimate? A. I have not.

Q. Did you make it up? A. No, sir; the electrical engineer made that up.

Q. You never have made any calculation? A. Not on that part of it; no, sir.

Q. Have you had in your possession the material for making

such calculation, or is it carried upon the books of the Company? A. It is carried upon the books of the company,
1905 in addition to what we use every year. We make report of it.

Q. Did you retain copies of your reports? A. In some cases.

Q. You never have used those reports in order to come to any exact understanding as to just the distances of the subscribers from the central office? A. Only for my own information. I never have been asked to do it, but still I did do it sometimes for my own information.

Q. What is it you did? A. I found the number of poles we have here in the city in the exchange, the number of miles of wire and the number of feet of cable of different kinds.

Q. That did not help you to determine the average distance of the subscribers, did it? A. It would, figured by the number of telephones we have got.

Q. Did you do that? A. I could do it; yes.

Q. You could do it, but did you do it? A. I don't know that I have done it.

Q. When you laid your underground cables on asphalt streets, how was it you did not break the asphalt? Where did you lay it; on the sidewalk or under the roadway? A. Here in Detroit, we generally kept ahead of that work.

Q. You generally did? A. Yes. In certain cases we
1906 have torn up the asphalt, but not any amounts to speak of.

Q. When you laid your cables along streets already asphalted, where did you put your cable; under the asphalt or under the sidewalk?

Mr. WORTHINGTON: I object to that question, because it does not appear that they ever did.

A. Always in the street.

Q. Under the asphalt? A. Yes.

Q. How much of that laying under asphalt did you do? A. Not a great deal, here.

Q. That is a very flexible expression, Mr. Beamer. What do you mean by "not a great deal?" A. I could tell by figuring out the streets. Generally we have to cross an asphalt street. We wouldn't follow the line of the street. We would simply cross it. Of course I would have to take and figure up the number of those streets we had to cross to give the number of feet.

Q. Have you ever done that? A. Done which?

Q. Have you ever figured up? A. No; I don't know that I have—not here. We went more into asphalt in Grand Rapids than we did in Detroit.

Q. Tell me how it is you arrived at an estimate of the cost of laying under asphalt in the city of Detroit? A. By the expense of putting back the asphalt.

1907 Q. Tell me how you reached that expense? A. By paying the parties to put it back. We would pay them so much a yard. This year it cost $2.50 a yard to relay it.

Q. Who did the work of excavation? A. We did it ourselves. We did no contract work. We did all the work ourselves, with the exception of putting back that class of pavement. We couldn't do that.

Q. Then when you wanted to cross an asphalt street your own construction gang would make the excavation? A. Yes, sir.

Q. They would lay the conduit and fill in the trench? A. Yes, sir.

Q. And do all the work except the relaying of the asphalt surface. Am I right? A. In some cases they would insist on putting back the concrete. We would fill in up to where the concrete would come in, and they would put that in themselves—that is, the city, the Board of Public Works. They did that here, but in Grand Rapids we did that. They wouldn't let us do it here.

By Mr. WORTHINGTON:

Q. You refer to the concrete foundation of the asphalt pavement? A. The concrete foundation; yes.

By Mr. BIRNEY:

Q. How did you personally determine the cost of the
1908 work done by your construction gang in such cases? A. I kept an account of it—of all the work that was done.

Q. Did you keep an account of the particular street crossing, or of all the work that was done by your construction gang in the course of a week, or two weeks, or a month? A. Do you refer to the asphalt?

Q. Yes. A. Of course, the work the asphalt people did they agreed to do it at so much a yard.

Q. That was the resurfacing, as you have explained? A. Yes, sir.

By Mr. WORTHINGTON:

Q. Did that apply to the resurfacing or to the concrete foundation and the resurfacing? A. Just the asphalt part of it; that is all.

By Mr. BIRNEY:

Q. Did you keep any records of the cost of the work done in

such cases by your construction gang in crossing such a street? A. The bills came to me to be O. K'd.

Q. Bills for what? A. For doing that class of work—the Board of Public Works, or whoever did it.

Q. You mean bills for the resurfacing only? A. For whatever they did for us. In same cases they did the concreting.

1909 Q. What record, if any, did you keep of the work in such cases done by your men? A. I kept all the record.

Q. Was there anything more than the pay-roll? A. Yes, sir.

Q. What was it? A. The record of material used in that construction.

Q. Did you separate in that case the work done under the asphalt from the work done upon the other streets with which that work under the asphalt connected? A. Yes, sir.

Q. How did you separate it? A. We kept account of everything. We kept account of how much cement we used, how much sand we used, how much gravel we used, how many feet of conduit we used; and every item of expense that was put into that work; and we kept an account of it to know the cost.

Q. Did you separate the distance occupied in crossing the street from the rest of the work? A. No, sir; only on the general line.

Q. That is to say, you would build a line perhaps several blocks long, say? A. Yes, sir.

Q. You took the whole cost of that, did you not? A. We took the whole cost of that.

Q. That would be made up of the pay-roll and of the material which you had bought for that entire distance? A. Yes, sir; that is, I speak of Detroit here. Of course, we have got

1910 asphalt pavement here in Detroit, but we never had to go through much of that. It was brick, mostly; but it is the same class of foundation, concrete, foundation. It costs more to handle than the other does, really, on account of the breakage of brick.

Q. Is there any difference in the cost of conduits, according to the number of ducts they contain? A. Yes, sir.

Q. Which cost more, the large conduits, or the small ones? A. The number of conduits put in, you mean?

Q. Yes; and the ducts. A. The greater number, the less cost, of course.

Mr. WORTHINGTON: Per duct foot, you mean?

A. Yes.

By Mr. BIRNEY:

Q. What are your largest conduits in Detroit; how many ducts do they contain? A. Thirty-eight, I think, in one trench.

Q. And the smallest? A. Two.

Q. Have you ever figured out to determine the average size? A. I don't know as I have.

Q. Do you feel able to make an estimate? A. The number of feet laid here?

Q. No; the average size of the conduits in ducts.

Mr. WORTHINGTON: You mean the average number of ducts?

1911 Mr. BIRNEY: Yes; the average number of ducts.

A. We have got a number of different sizes here. I should say about eight ducts.

Q. That is an estimate only, and not intended to be certain or accurate? A. No, sir.

Q. In Grand Rapids did you lay your conduits under asphalt pavements? A. In some cases.

Q. About a thousand feet, I think you said? A. Somewhere in that neighborhood. It might possibly be a little more than that.

Q. Are you able to tell exactly how much it was? A. I could tell by getting the map and figuring it up.

Q. You have not done that? A. No.

Q. Did you also cross asphalted streets there? A. In some cases; yes.

Q. How large were your conduits in Grand Rapids; how many ducts? A. Where we laid in the asphalt we laid twenty ducts.

Q. And did they vary as in Detroit? A. They varied. As we got away from the office, of course, they dropped off; but that was the largest lead from the Grand Rapids office in any one direction—twenty ducts.

Q. You said you estimated the cost in Detroit per duct foot, as I understand you, at 30 cents. Did you also make

1912 any calculations of the cost in Grand Rapids? A. Not 40 cents in Detroit; 20 cents. That was our estimate. I don't think we exceeded that in any case.

Q. That was the amount, then, as I understand, which was allowed in advance, or estimated in advance, as the possible cost? A. Yes, sir.

Q. You did not exceed it in any case? A. No, sir.

Q. Did you fall below it? A. Yes, sir.

Q. How much below? A. Down as low as five cents below—to 15 cents.

Q. Was that the lowest? A. About the lowest we did here; yes.

Q. You cannot give the exact cost? A. No; I can't.

Q. How was it in Grand Rapids? A. It was still lower in Grand Rapids.

Q. It cost there about how much? A. We did some work there for less than 12 cents.

Q. How large were the conduits which cost you there less than 12 cents? A. Eight ducts, principally.

Q. Did you determine the cost of the 20-duct conduits? A. Yes; it was all figured in.

Q. How much did they cost? A. They didn't cost quite so much in Grand Rapids. Where we would lay so many
1913 it would decrease the cost per duct.

By Mr. WORTHINGTON:

Q. You are giving the cost in each instance per duct foot, are you? A. Yes, sir.

By Mr. BIRNEY:

Q. How much did they cost less than 12 cents? A. Probably a cent and a half.

Q. What was your highest cost in Grand Rapids? A. I don't think we had any to exceed 15 cents in Grand Rapids.

Q. What caused that difference? A. The different class of pavement. There was quite a large amount that we put in in Grand Rapids, where there wasn't any paving. Still we used the same base there on the work—20 cents a duct foot. We didn't come down on the estimate any.

Q. You have stated that the cost to the Michigan Telegraph Company for 70-foot poles was $20? A. About that; yes.

Q. How many 70-foot poles has the Michigan Telephone Company in use in Detroit? A. Very few. What they have got are spliced poles. As a general thing they cost more money, you know, than a straight pole.

Q. You say a "very few." How many do you mean? A. I don't think they have got to exceed 50 poles that exceed
1914 60 feet. They may have.

Q. How many of them reach 70 feet? A. Not over two or three.

Q. When were they bought, Mr. Beamer? A. In 1893.

Q. Did you buy them? A. No, sir.

Q. Who did? A. Mr. Forbes, the general manager.

Q. How do you know what they cost? A. I usually saw the bills.

Q. Did you see the bills in that case? A. Yes, sir. Poles at that time did not cost so much money as they do now.

Q. What was the cost of 60-foot poles when you left the company? A. The schedule of prices was $10.

Q. 55-foot poles? A. About $8 or $8.50.
Q. 50-foot? A. $7.

By Mr. WORTHINGTON:

Q. Are you giving the price of the poles themselves, or does it include the setting? A. The price of the poles delivered in Detroit.

By Mr. BIRNEY:

Q. Are those poles, when delivered, trimmed and grained? A. No, sir; nothing more than to have the bark off them.

1915 Q. You have said that the work of construction and of maintenance was under you. Please tell what were your duties. A. In a general way, I had charge of all construction, both exchange and toll lines. The putting in of two or three telephones, or such a matter as that, would be handled by the managers of the different exchanges and the men that they had directly under their charge; but any additional work that they could not handle I always took care of.

Q. Did you do the buying? A. No, sir.

Q. Then you looked after the outside men? A. Yes, sir.

Q. Is that about right? A. That is about right, sir.

Q. You made requisitions on the office for what you wanted? A. Yes, sir.

Q. And you turned in your pay-rolls and accounted for the material which the office furnished you? A. Yes, sir.

Q. Is that about right? A. Yes, sir.

Q. Did you have anything whatever to do with the accounts? A. Not anything more than the men that came directly under my charge—their expenses, salaries, hiring and discharging them, and such minor things that I would have to buy that would not go through the office.

1916 Q. When the goods were furnished you which you ordered for the use of your men were you always provided with a statement of the cost? A. In some cases; not always.

Q. Was that a regular thing, or not? A. No; it was not a regular thing.

Q. Who did the buying for Detroit? A. The general manager. They had a supply department here that supplied some things; but as a general thing the general manager did all the buying. It went through his office.

Q. Mr. Beamer, how much of your time did you give to examination of the work done by the Detroit Telephone Company? A. Not a great deal of it. I would just be passing the streets and looked at them doing the work. As I was going along I would stop a few moments to see what they were doing.

Q. That is the extent of your observation? A. Yes, sir. Of course I did that a great many times.

Redirect examination.

By Mr. WORTHINGTON:

Q. Mr. Beamer, are you sufficiently acquainted with the location of the different stations of the subscribers of the Michigan Telephone Company in Detroit to be able to state approximately substantially the average distance of those subscribers from their respective exchanges?

1917 Mr. BIRNEY: Objected to as being a repetition of the questions asked in chief.

Q. I want to know whether the estimate you gave in reply to my questions is a mere guess, or whether it is substantially correct? A. I couldn't say about substantially correct, because I am simply giving an estimate. I never figured on it. I told you a quarter of a mile from the central office, and a mile from the other exchanges, I think. It might be less and it might be greater. But still the tax statement will show. They have that in blue print form in the office. Of course, I couldn't remember those exact figures. I have had it in my hands, but I couldn't give it.

Q. Does the estimate which you have been giving us of the cost per duct foot of underground conduit here and in Grand Rapids include manholes? A. Yes, sir.

Q. Did you have anything to do with the approval of bills for material or labor in the work of construction? A. They all came through my office. That part of the material I had charge of buying—that is, cement, sand and gravel; but the conduit was bought by the general manager.

Q. Did the bills for conduit come through your office and under your inspection? A. Yes, sir.

JAMES BEAMER.

Signature affixed by the Examiner, by consent of counsel.

A recess was here taken until 3 o'clock p. m.

1918 *After Recess*

WILLIAM J. BERRY, a witness of lawful age, called by and on behalf of the defendant in rebuttal, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. Mr. Berry, where do you reside? A. Grand Rapids, Michigan.

Q. May I ask your age? A. Thirty-five years.

Q. And your present occupation? A. General superintendent of the western division, Michigan Telephone Company.

Q. How long have you held that position? A. Since the 1st of February, 1899.

Q. What position did you hold before that? A. Manager of the Grand Rapids exchange.

Q. Of the Michigan Telephone Company? A. Of the Michigan Telephone Company.

Q. For how long? A. Since November 1st, 1890.

Q. Where do you perform the duties of your present office? A. At Grand Rapids, Michigan.

Q. In your position as general manager, and afterwards as superintendent of that division, did you become familiar with the construction of the Grand Rapids exchange of that
1919 company? A. Yes, sir.

Q. What sort of a plant did it have in 1890? A. We had an aerial plant, aerial cables, pole lines, multiple switchboard.

Q. When did you get the switchboard?

Mr. BIRNEY: This line of examination is objected to as not being proper in rebuttal.

A. The switchboard was installed in April, 1889.

Q. I wish you would describe in a general way your overhead plant, that you had at that time; the height of the poles, the kind of wires, etc. A. It would be such as was needed in a town of that size to carry a large number of wires and cables above the electric light wires and wires of telegraph companies and other companies—a general overhead system.

Q. What was the height of your poles; how did they run? A. They would run from 40 to 60 and 65.

Q. Was that the length of the pole before it was planted? A. Before it was put in the ground. The outside lines, of course, would run smaller.

Q. How small? A. Away down to 25's, in the outskirts.

Q. If you would average all your poles, about what would be the length? A. I should judge about a 35 or 40 foot pole.

Q. Of which how much would be in the ground? A.
1920 It depends on the size of the pole. It would average about 5 feet, I should judge.

Q. What did those poles cost? A. I am really not in a position to say for a certainty.

Q. You did not have to deal directly with the cost of things? A. The poles were put in before my time.

Q. You had to deal in poles, I suppose, more or less, while you were manager? A. Oh, yes.

Q. Do you know what they cost then? A. Thirties would cost nearly $2, and sixties would cost between $10 and $12, sometimes $14.

Q. Is that the pole without any preparation for use? A. Yes, sir.

Q. What would they cost, planted in the ground, ready for cross-arms? A. That would depend largely on the locality in which we were working.

Q. How was the average? A. That would be very hard to say.

Q. Why does it depend on the locality? A. In some places we had to cut into stone walks and set the poles. In other places we would have to dig through area walls or inside area walls as you would in the city. At other places it was entirely free digging, and that would cost considerably less money.

1921 Q. Can you tell us what it would cost when it was free digging, for the average of your poles? A. I wouldn't care to say so much about that, as that was largely under the construction department. We paid very little attention to it.

Q. What kind of wire did you use on these poles? A. Steel wire.

Q. What kind of a circuit did you give your subscribers? A. It was a grounded circuit when first put up, afterwards changed to a common return system, for ordinary service. Metallics were No. .080 copper.

Q. What proportion of copper did you have in those days? A. When it was first built, we had none.

Q. Then when the long distance lines came into your town, were some of the subscribers equipped with the long distance copper wire circuit? A. Yes.

Q. What has been the charge in your exchange for long distance equipment? A. At present?

Q. I wish to know what it has been and what it is. A. It was first $90 per year for business and $60 for residence service, independent lines; afterwards it was changed to $72 for business subscribers and $54 for residence subscribers. Do you want to know what it is now?

Q. Yes. A. It is now $48 for business subscribers and $36 for residence subscribers.

1922 Q. When was the change made from $90 to $72 for business long distance telephones? A. April 1st, 1895.

Q. When was the change made from $72 to $48? A. In the meantime we had a half rate for business subscribers of $36, for about two years; but on the 1st of January of this year the rates were changed from the half rate, which would be $36, to $48 for business and $36 for residence.

Q. You are speaking now of the long distance equipment? A. Entirely.

Q. How many subscribers have you had connected with

your exchange in Grand Rapids during the time you have been connected with it? A. We had about 1,550 at one time.

Q. When was that? A. I think it was June, 1893.

Q. Did the number decrease or increase after that? A. The number decreased during the hard times.

Q. How many have you now? A. With those under contract and lines under construction, between 2,400 and 2,500.

Q. How many have you, leaving out those which are under contract and under construction? A. I can't tell you, sir. The system changes every day. We have got a large number of men, and it is hard telling what condition the business is in to-day.

Q. I believe there has recently been a change in the management of the Michigan Telephone Company? A. It
1923 has the same general manager.

Q. But different persons have come into control? A. I understand so.

Q. Has there been a difference in your methods of business, or rather, of getting business? A. Yes; we carry on a systematic canvass for business and it is very successful.

Q. When did that begin? A. That began in Grand Rapids, the latter part of March.

Q. Of this year? A. Yes, sir.

Q. Prior to the time this active canvass which has made ascertainment of details difficult, what was the average distance from your exchange of your subscribers in Grand Rapids? A. About one-half mile.

Q. How many subscribers did you have at that time, say, in February last?

Mr. BIRNEY: My objection applies to all this line of examination.

A. About 1,300.

Q. How many of those were business and how many residences? A. They were about equally divided.

Q. What was the average distance of the business subscribers from the central exchange? A. I should say about a quarter of a mile.

1824 Q. Is your plant in Grand Rapids still an overhead one? A. What is working of the old system is.

Q. Have you changed it in any way in that regard? A. We are putting in a complete underground system that will cover the entire business district and a portion of the residence district.

Q. When did that change to the underground system begin? A. About four years ago.

Q. What has become of the old pole lines within that district? A. They are still up, carrying overhead cables, that

will be taken down when the underground system is completed.

Q. Do you mean the overhead system within that territory will be abandoned? A. Altogether.

Q. How long will it have lasted from the time it was put up, before the abandonment? A. About ten years.

Q. As to your switchboard which you put in, in 1890, did you say? A. In 1889.

Q. What is the situation of that? A. That will be abandoned.

Q. When? A. As soon as the new switchboard is installed that we are working on.

1925 Q. What kind of a switchboard did you have? A. We had a multiple switchboard.

Q. What are you installing in its place? A. A multiple switchboard known as the Relay system.

Q. How long has the Relay system switchboard been in use? A. That is a hard question to answer.

Q. In the form in which you are having it installed in your exchange? A. The form that we are using is really a new invention. In fact, we arranged for one of those switchboards as soon as it got beyond the experimental stage.

Q. Have you had anything to do with the operating department of the exchange while you were general manager? A. Yes, sir.

Q. That was included in your bailiwick? A. Yes, sir.

Q. From your experience there, what would you say as to whether or not, as the number of subscribers has increased, the calls per subscriber have increased or decreased? A. The calls per subscriber increased.

Q. Could you give us any figures as to that? A. Only from memory.

Q. Give it from memory, please. A. When we had about 1,200 subscribers, the average calls per subscribers were about seven. When we had 1,500 subscribers, the average

1926 calls were about nine.

Q. Have you had anything to do with the financial part of the business? A. Only so far as it related to the operating expenses of Grand Rapids.

Q. Are you able to tell us whether the Grand Rapids exchange, of which you have been manager or superintendent, has done a paying business? A. Not altogether.

Mr. BIRNEY: This is objected to unless it is the purpose of counsel to produce the books of account upon which it is evident the witness is about to speak.

By Mr. WORTHINGTON:

Q. When you say not altogether, do you mean you are not able to tell us, or what? A. I am not able to give the information for the reason that that part of the business was in the hands of superior officers.

Q. Could you give us any information, approximate or otherwise, as to the expense attending the installation of this underground plant in the last four years? A. No, sir.

Q. Do you know what the new switchboard will cost? A. No, sir.

Q. Where does the money come from to construct that underground plant, or supply the new switchboard? A. I never inquired.

1927 Q. Do you know whether or not it comes from the earnings of the company, or is from some outside source? A. I have no way of knowing at all.

Q. What is the extent of the territory covered by the company which now controls that exchange? A. Do you mean the company that controls the Michigan Company?

Q. Yes; I understand the Michigan Company controls the greater part of Michigan. A. It does control all of Michigan.

Q. Has it under the same general control or management any other territory? A. No, the Michigan offices have not. The Michigan offices only have charge of the Michigan Telephone Company.

Q. Does the Michigan Company belong to some system which controls other States? A. I understand so.

Q. What is that system? A. I understand they are controlled by the Erie system.

Q. Which embraces what territory? A. It embraces Cleveland and Cuyahoga County in Ohio, Texas, Arkansas, Michigan, Wisconsin, Minnesota and North and South Dakota.

Q. Can you give me any idea of the number of subscribers in that system? A. I could not.

1928 Q. What is the number in Michigan alone? A. I couldn't give a fair idea about that. My interests are very largely in my own territory.

Q. What proportion of the original plant of your Grand Rapids exchange will be left when you get through with the present improvements? A. Not enough to base an estimate on.

Q. Let me ask you, in view of your experience, what is a proper allowance, in keeping the accounts of a telephone exchange, for depreciation in plant? A. For an overhead system, I should say ten per cent. That is our experience at Grand Rapids.

Q. Have you any opposition at Grand Rapids? A. Yes, sir.

Q. What is the name of the opposition company? A. The Citizens' Telephone Company.

Q. Is that the one that Mr. Ware and Mr. Boyce are connected with? A. Yes, sir.

Q. Who have testified in this case? A. I understand so.

Q. How long has that exchange been in operation? A. Since July 1st, 1896.

Q. What kind of a plant did they put up? A. An overhead system.

Q. I wish you would describe it, in a general way. A. I don't know but what my answer in regard to our own exchange will cover that question quite well. It is an
1929 overhead plant, such as it would be compelled to construct after another telephone company had been in the field, and where there was a street railway system and two electric light companies.

Q. Did it have in a general way about the same kind of poles and wires, or was there some difference? A. There was some question about the quality of poles. Their tall poles are very largely spliced poles—two poles spliced to make one.

Q. What do you think of that as good construction? A. We don't do it ourselves, only in extreme cases.

Q. Does that make a cheaper pole or not? A. We think it does.

Q. How many wires do they carry on their poles—the maximum number? A. There are places where they have nearly 200 wires.

Q. Does that include cables? A. No, sir.

Q. Do they, besides 200 wires, have cables in addition on the same poles? A. Yes, sir; on the same poles.

Q. Have you, at our request, had some photographs taken of a portion of that plant? A. Yes, sir.

Q. Have you brought the photographs with you to-day? A. No; they were not completed in time.

Q. When will they be completed? A. I think to-morrow. They are promised to-morrow.

Q. Were you present when they were taken? A. I
1930 was not present when they were taken. I left directions as to where they were to be taken.

Q. Do you know Mr. Crenshaw, who is here present? A. Yes, sir.

Q. Was he at Grand Rapids recently, and did he with you inspect the plants there? A. Yes, sir.

Q. Do you know whether or not he saw these places where these photographs were to be taken? A. Yes, sir.

Q. And heard the instructions which you left with the photographer to take the photographs at those places which Mr.

Crenshaw had indicated? A. Yes, sir; two views were taken of one place where it was impossible to take all in one.

Q. Has the Citizens' Company at Grand Rapids been making any changes in its plant recently? A. They began the putting in of underground conduits about the 1st of May.

Q. Of this year? A. The 1st of May of this year.

Q. What is the extent of their projected underground system? A. The only part I am familiar with is the route as given or asked for of the common council for permission to do this work, which would cover the business section of the town with their trunk lines for their large conduit quite thoroughly.

1931 Q. To what extent will that, if carried out, replace their existing overhead lines? A. I am not sure as to whether they intend to use it or not.

Q. Do you mean they are constructing an underground plant and you do not know whether they are going to use it or not after it is constructed? A. We don't guess at anything of that kind, and know nothing of it until we see it done.

Q. If the overhead plants within the territory covered by this projected underground plant should be transferred to the underground system, what proportion of their plant would be left? A. It would do away with the larger part of their heavy pole lines in the business part of the city.

Q. Then they would be abandoned in that case after about three years' use? A. If they should use the underground system; yes, sir.

Q. As to the poles of the Citizen's Company and their carrying free wires and also wires in cables, what is the maximum number of wires, all told, on their poles? A. On all of their poles?

Q. On any of their poles, what is the maximum number—free wires and wires and cables together? I understood you to say they had about two hundred wires on some of their poles, and there were also cables on the same poles. How many

1932 wires in all? A. On their East Fulton street lead they have two 50-pair cables, with 100 wires in each. That would be 200 wires additional to the 200 which I think that lead carries.

Q. Is there any case you recall of poles near their exchange where more wires than that are carried, cables and all? A. Coming into their exchange they have a large number of cables that are carried on poles to within 100 feet and less of the exchange building.

Q. How many wires would be the load of the poles there? A. That would be largely a matter of guesswork.

Q. You can make a better estimate than we can, who have not

seen it. A. There must be 2,400 on the Lewis street lead, where it enters their building.

Q. What kind of manholes does your company use in its underground construction? A. They are made of brick.

Q. What kind of covers do you use? A. Cast iron.

Q. What is the interior measurement of the manholes? A. It depends altogether on the location and the number of ducts. They are a very good size, large manhole, and as I stated before the number of ducts entering the manhole and leaving it, and the branches, determines the size of the manhole altogether.

Q. Are those cast-iron covers single or double? A. They are single, in one piece of casting.

Q. They are not fastened in any way? There is nothing to prevent anybody lifting them off and getting in if they wanted to? A. Not if they knew what side to lift on.

1933

Cross-examination:

By Mr. Birney:

Q. In what way have you informed yourself of the number of wires on the poles of the Citizens' Telephone Company? A. I have not informed myself. I stated in my answer that it was a matter of guesswork.

Q. That is so concerning the Lewis street entrance? A. That is the only one I answered in regard to, the Lewis street lead, and I stated at that time that it was largely a matter of guesswork.

Q. How do the wires enter their central office at the Lewis street entrance? A. At the Lewis street entrance?

Q. Yes; or from the Lewis street lead, as you term it. A. They enter running from a pole on Lewis street at the corner of Campo, running at an angle of about 45 degrees into a cupola or house built on the roof. There is also leaving that cupola a number of cables running almost due south to a pole on Campo street. My estimate as to the number of wires included the wires that left the cupola or building at that point.

Q. Do you mean the number of wires that leave that cupola in any direction? A. No, sir; from the side of the cupola. The wires that lead in that direction all run in the south side of the cupola.

Q. How many wires from that side of the cupola are carried on any one line of poles? A. Possibly 1,600.

1934

Q. That is guesswork, also, is it? A. Entirely so.

Q. You have said that at some other places there are two 50-pair cables and 200 wires additional. How do you ascertain the number of wires in addition to the cable? Is that guess-

work? A. By their own statement as to their use of 50-pair cables entirely.

Q. I understood you to say there were 200 wires in addition to those contained in the cables? A. About that number, I stated.

Q. You have not counted those wires? A. Not for this purpose; no, sir.

Q. Have you for any purpose? A. As a rule, in noticing a large load of wires I notice about how many arms they have on a pole. They have at that place about 10 arms, and they have 20 wires on each arm.

Q. Are you sure of the number of arms? A. I said "about." I have not investigated their plant for this purpose or any other. It is only a general knowledge.

Q. It is a general estimate which you make from casual observation, is it not? A. It is not entirely casual observation, as we would have a better knowledge of their plant than
1935 we would of an electric light plant carrying the same number of wires, or of an electric railway, as it happens to be in the same business we are.

Q. Except for that, it is pure estimate? A. It is an estimate; yes, sir.

Q. You stated that your charges are now $48 and $36 respectively for business and residence telephones with the long distance equipment? A. Yes, sir.

Q. What do you mean by that term? A. Copper wire metallic circuits and solid back transmitters, with heavy batteries for the instruments.

Q. It is a metallic circuit? A. Yes, sir.

Q. What do you charge for the other styles of telephones which you put in? A. At the present time?

Q. Yes. A. $24 a year for business and $12 for residences.

Q. What kind of service, or equipment rather, do you give at those rates? A. Ordinary service, such as is given in the telephone business generally.

Q. Do you use the Blake transmitter? A. Very largely; yes, sir.

Q. Is that the grounded circuit? A. No, sir.

1936 Q. What kind of circuit do you have in connection with those? A. The common return system.

Q. How many lines of the first type have you in operation; the long distance or metallic circuit type? A. About 150.

Q. And of the others, what are they? A. They are ordinary service.

Q. With the Blake transmitter and common return? A. Yes, sir.

Q. Did you give me the price charged for residences? A. $12.

Q. Have your prices ever been lower than these? A. Not on a rental; no, sir. It is the lowest rental we ever charged.

Redirect examination.

By Mr. WORTHINGTON:

Q. Do you know whether or not the Citizens' Company in Grand Rapids has issued stock for the purpose of raising money to build this underground plant that it is constructing? A. I notice a report in the papers—

Mr. BIRNEY: Counsel for complainants objects to the witness stating what he has seen in the newspapers as purely hearsay and incompetent.

A. I notice a report in the papers stating that notice has been given in the County Clerk's office of an increase in the capital stock of the Citizens' Telephone Company from
1937 $200,000 to $300,000.

Q. When was that? A. It has been, I think, within the last sixty days.

Q. Have you any information, aside from that, that this stock has been increased in that way? A. It is general knowledge in Grand Rapids.

Q. Mr. Berry, you have said that you are not familiar with the financial results of the business in Grand Rapids of your company. Do you know enough about it to know whether or not the business can be carried on at a profit at such rates as $24 for business and $12 for residences?

Mr. BIRNEY: That is objected to, because the witness has already shown that he has no knowledge of the financial results of the business.

A. That is a matter that I do not question or inquire in regard to. The information would be in the hands of the superior officers, who would have the information that I have not.

Q. I understood you to say that you know what your operating expenses are? A. I don't remember saying any such a thing as that.

WILLIAM J. BERRY.

Signature affixed by the Examiner, by consent of counsel.

A recess was here taken until 4 o'clock p. m., at the office of the Michigan Telephone Company, Detroit, Michigan.

1938 After recess.

HARRY J. BOOTHE, a witness of lawful age, called by and on behalf of the defendant in rebuttal, having been duly sworn, is examined

By Mr. WORTHINGTON:

Q. What is your age? A. Thirty-two.

Q. Your residence? A. 210 Stanton avenue, Detroit, Michigan.

Q. What is your business at present? A. Auditor of the Michigan Telephone Company.

Q. Where is your office as auditor? A. No. 54 Telephone Building.

Q. The building in which we are taking this testimony in Detroit? A. Yes, sir.

Q. How long have you held the position of auditor? A. I think five years.

Q. Do you know Cyrus James Akin? A. Yes, sir.

Q. Was he connected with the auditor's office at any time? A. Yes, sir.

Q. In what way? A. As accountant.

Q. And was he so employed in 1896 and 1897? A. Yes, sir.

1939 Q. What was your position before you became auditor of this company? A. Chief clerk.

Q. Do you remember when Mr. Akin left the service of the Michigan Telephone Company? A. In August, 1897.

Q. Do you know where he went when he left? A. To the Detroit Telephone Company.

Q. The opposition company? A. Yes, sir.

Q. Mr. Akin has testified in this case, in substance, that while in the employ of the Michigan Telephone Company he made up a statement, at the request of Mr. Forbes, showing the annual cost of maintaining the company's telephones in the city of Detroit, and that by that statement he ascertained the annual cost in the city of Detroit of maintaining telephones of the Michigan Telephone Company "was $16 and some cents —$16.94," he thought. Do you know anything about that statement? A. Per subscriber?

Q. Yes. A. Yes, sir.

Q. Where is the statement, if you know? I don't know where the original is.

Q. What was Mr. Akin's habit, if he had any, in reference to keeping copies of such papers? A. He was very particular to take impression copies.

Q. They were kept in what we call a letter book? A. A book called "Statistics."

Q. In which copies were taken of the originals? A. Yes, sir.

1940 Q. By pressure? A. Yes, sir.

Q. Have you here the book containing the copy of that statement? A. Yes, sir.

Q. Please produce it.

(The witness produces here an impression-book entitled on the outside "Statistics," and opens it for counsel at page 76, upon which there appears a statement headed "Detroit Exchange.")

Q. Is that statement upon that page the impression copy of the statement to which you refer? A. That is the only statement of which I have any knowledge—that impression copy.

Q. What date does that statement bear? A. July 21, 1897.

Q. Do you remember when that statement was made, or do you recall the fact that it was made? A. Indistinctly, yes.

Q. Is there in this book any other statement of a similar character about the same time? A. Yes; I think there is.

Q. I want to know whether there is any other statement here which could be the one referred to by Mr. Akin. A. Not in reference to the Detroit exchange; no, sir.

Q. Mr. Akin has testified, as you do, that he left the employ of the Michigan Telephone Company in August, 1897, and that the statement which he made was "just prior to leaving there." Is there any statement in this book within a

1941 few weeks or months preceding August, 1897, which could, by any possibility, be the statement which Mr. Akin testified to, except this one? A. There is not.

Q. Do you know whether, shortly after Mr. Akin gave his testimony in this case, the original of which this impression on page 76 purports to be a copy was searcheed for? A. I believe so; yes, sir.

Q. Do you remember that there was an inquiry made about it at that time by counsel for the defendant company? A. Yes, sir.

Q. And that the original could not be found?

Mr. BIRNEY: Objected to as clearly leading, and as a statement of counsel rather than a statement by the witness.

By Mr. WORTHINGTON:

Q. Where would the original of this paper, which was prepared at the request of Mr. Forbes, have gone in the ordinary course? A. To Mr. Forbes.

Q. What office did he then hold in the company? A. President and general manager.

Q. What position does he now hold? A. General manager.

Q. He is still here, and is in the room while this testimony is being taken? A. Yes, sir.

Mr. WORTHINGTON: Counsel for the defendant give notice that they will hereafter prove by Mr. Forbes the loss
1942 and unsuccessful search for the original paper. We now offer in evidence this impression-copy on page 76.

By Mr. WORTHINGTON:

Q. Is this impression in typewriting or in handwriting? A. Typewriting.

Q. There is no handwriting about it? A. No, sir.

The above mentioned paper is as follows:

"Detroit Exchange.	5 months Jan. to May, 1897.	5 months Aug. to Dec., 1896.
Average No. of subscribers.....	4,103	4,257
Average expense per Sub.....	16.95	$20.48

7-21-97."

By Mr. WORTHINGTON:

Q. At that time, did Mr. Akin have charge of the keeping of any books which would furnish data for the making up of any such statement as that? A. He did.

Q. Have you here the book which would give the data in detail, corresponding to the summary in that paper? In other words, have you here the book which would show the expense of the Detroit exchange for the five months from January to May, 1897, and for the five months from August to December, 1896? A. Yes, sir.

Q. Have you to-day, at the request of counsel for the defendant, gone over those items for the purpose of ascertaining whether or not they agree with the summary given in
1943 this exhibit on page 76? A. I have.

Q. Have you made a memorandum of the result? A. Yes, sir.

Q. If so, please tell us what it is. Take first the five months from January to May, 1897, inclusive, assuming the average number of subscribers to be 4,103, and what is the result? A. $18.13.

Q. You mean $18.13 is the average expense per subscriber during those five months? A. Yes, sir.

Q. And for the five months from August to December, inclusive, 1896, assuming that the average number of subscribers was 4.257, what do you find to be the result? A. $21.55.

Q. Do I understand that statement is made up from the

books kept under Mr. Akin's direction? A. They are—both of them.

Cross-examination.

By Mr. BIRNEY:

Q. What recollection, if any, have you of the original paper of which this appears to be a copy? A. None.

Q. In January last, and after Mr. Akin had testified concerning the statement made up by him, did you show him this page in this book? A. Yes.

1944 Q. Did he not then request of you that you show him the original? A. I don't think so.

Q. Did he not then state to you that this could represent only a part of the original paper? A. No, sir.

Q. And that he wished to see the whole of it? A. Yes.

Q. You were unable to show him the original? A. Yes.

Q. Did you ever make a search for the original? A. No, sir.

Q. Who fills the place now which Mr. Akin filled? A. No one.

Q. Who discharges the duties which he discharged? A. The chief clerk.

Q. What is his name? A. John J. Boothe.

Q. Do you know when this impression was made? A. No.

Q. Who made it? A. I don't know.

(At this point counsel for the complainants examines the papers on the pages preceding and following page 76.)

Q. What is the date of the copy in question on page 76? A. July 21, 1897.

1945 Q. Look at the copy of another document on page 75 preceding that entry, and tell me what date that is? A. July 22, 1897.

Q. And on page 74? A. July 22, 1897.

Q. Both of those papers bear date subsequent to the paper about which you have been testifying? A. Yes, sir.

Q. It would appear that your examination of the expense of the subscribers' lines in each of the periods in question, that is to say, from August to December, 1896, and from January to May, 1897, does not bring the same results as those which appear in this paper copied on page 76. Are you able to state how that comes about? A. I don't know; no, sir.

Q. What did you examine for the purpose of reaching a conclusion as to the cost during those periods? A. The book containing the record that gives the expenses.

Q. Who kept that book? A. A clerk.

Q. In whose custody was the book? A. The accountant's at that time; the chief clerk's now.

Q. You made no entry in it yourself? A. No, sir.

Q. Did you examine any original papers? A. I looked them over; yes.

Q. What papers? A. You say do I examine them?

1946 Q. Did you examine any, in looking up this statement? A. Yes, sir.

Q. What original papers? A. The book containing the original entries.

Q. What is that styled? A. Monthly record of business, by exchanges.

Q. Did you examine anything other than that book? A. No, sir.

Q. The statements contained in that book are made up from other original papers sent in from the different exchanges, are they not? A. Yes, sir.

Q. Did you examine those papers? A. No.

Q. Were you satisfied with taking the entries in the books? A. Yes.

Q. How do you know that was the same material which was employed by the person, whoever it might have been, who made up this statement on page 76?

Mr. WORTHINGTON: I object to that question because it assumes that the witness stated the same material was used.

Mr. BIRNEY: I think he has.

A. It is the only place he could have gotten that information from; and there are earmarks on the book that show that somebody marked off those particular months, to make the additions.

1947 Q. What are those earmarks? A. Pencil lines separating the first seven months of 1896 from the last five months.

Q. Would you produce that book, so that I may look at it?

Mr. WORTHINGTON: Counsel for the defendant informs counsel for complainants that the book is on the table in front of the witness, and has been while he has testified; and the witness is requested to turn to the months in question.

The witness produces a book which is entitled "monthly record of business by exchanges" and turns to a page, not numbered, headed "Detroit exchange," and exhibits the account in question to counsel for complainants.

By Mr. BIRNEY:

Q. Will you please point out to me the account in question? A. This (indicating) is the statement for 1896 of the Detroit exchange. Under the head "total general expenses" appear these figures, for the year. Under the head of "Total operat-

ing expenses" are given the figures for the year. Under the head of "Total maintenance" are given the figures for the year; and under the head of "Total rental and royalty" are given the figures for the year also. Those figures are given month by month.

Q. Will you point out to me the earmarks which you say exist on that account? A. There is one, under "Total rental and royalty."

1948 By Mr. WORTHINGTON:

Q. Drawn between the figures for what month? A. Between the figures for July and August.

By Mr. BIRNEY:

Q. There is a pencil line? A. A pencil line; yes.

Q. Is that the only earmark, to which you refer? A. Also a pencil mark under "Total maintainance," between the months of July and August. The mark is made faintly because it was not intended as a part of the record, but simply as a temporary mark.

Redirect examination.

By Mr. WORTHINGTON:

Q. Please state whether, when you went to see Mr. Akin about this entry and showed him the impression on page 76 of this book, you were accompanied by anybody else? A. Yes, sir.

Q. By whom? A. By Judge Wilson.

Q. Did Mr. Akin say anything further in explanation of this statement—anything in addition to what has been called out by Mr. Birney's questions? A. He talked further about it; yes, sir.

Q. What did he say? A. He said that he thought this was the statement he had testified to; that it would make no difference what period was taken if an average was arrived at; it would be the average for the yeaer.

1949 Q. Did he give any explanation of why, when the paper showed on its face it gave the average expenses for five months only, he had testified it gave the average annual expenses? A. The explanation I have given you, that it being for five months, it would be the same for a year.

Q. Were you called upon to examine this book immediately after Mr. Akin had given his testimony, last January? A. I was.

Q. Will you state whether or not you found this entry then in it in the same condition in which it is now? A. I did.

Q. How long after you found it was it that it was taken

around and shown to Mr. Akin? A. I don't recall now.

Q. Do you remember whether it was the same day? A. It was not.

Q. Do you remember that we were here taking depositions and that we went to Chicago and Ft. Wayne, and then returned here, and it was then shown to him? A. I remember that was so stated.

Q. Please look at the entries on the ten pages preceding page 76 and give the dates which appear. A. Page 66, June 14th, 1897; page 67, no date; page 68, June 23, 1897; page 69, no date; page 70, May 31, 1897; added in lead pencil in Akin's handwriting; page 71 there is a date, but I cannot tell what it is. It is July, but the rest is not copied. The figure 7 appears, but nothing else. Page 72, July 17th, 1897; page 73, again only the figure 7 can be discerned; page 74, July 22, 1897; page 75, July 22, 1897

1950 Q. Now please take the ten pages following page 76, and tell us what dates are there. A. Page 77, July 28th, 1897, page 78, July 28th, 1897; page 79, no date; page 80, no date; page 81, no date; page 82, no date; page 83, no date; page 84, no date; page 85, no date; page 86 is missing, torn out.

Q. Page 87, what date? A. No date.

Q. This book is entitled "Statistics." Will you tell us what manner of papers were entered in it generally? A. All matters pertaining to statistics with reference to the telephone business that would naturally come through the auditor's office.

Q. It does not contain letters? A. No, sir.

Q. That is a separate book? A. A separate book, yes, sir.

Q. In whose charge was this book after Mr. Akin left the company, in August, 1897? A. The chief clerk, J. J. Boothe.

Q. Is he here? A. Yes, sir.

Q. Will you please ask him to come in? A. Yes, sir.

HARRY J. BOOTHE,

Signature affixed by the Examiner by consent of counsel.

1951 JOHN JAMES BOOTHE, a witness of lawful age, called by and on behalf of the defendant in rebuttal, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. Mr. Boothe, what position do you hold at present? A. Chief clerk.

Q. Were you connected with this company in the summer of 1897? A. Yes, sir.

Q. What position did you hold then, when Mr. Akin was here? A. I guess it was assistant to the auditor.

Q. After he left, were you chief clerk? A. Yes, sir.

Q. As chief clerk, and since he left, have you had charge of this book which has been produced here, entitled "Statistics?" A. Yes, sir.

Q. There is an entry on page 76 of that book. I want to ask you if you know anything about that entry, and whether it was in the book when Mr. Akin left or has been put in since, if you have any recollection about it? A. No, sir; I don't recognize it at all. I think the figures are his, but I wouldn't swear to them.

Q. You are speaking of the figures in pencil? A. Yes, sir.

Q. I am speaking of the typewriting only. A. No; there is nothing there but what was put in at the time. There
1952 has been no change.

Q. I want to know whether the book has been doctored by putting that entry in there since he left? A. No, sir; it has not.

JOHN J. BOOTHE.

No cross-examination.

Signature affixed by the Examiner by consent of counsel.

F. A. FORBES, a witness of lawful age, called by and on behalf of the defendant in rebuttal, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. What is your position, Mr. Forbes? A. General manager.

Q. Of what? A. Of the Michigan Telephone Company.

Q. How long have you held that place? A. I don't remember the date.

Q. Tell us about how many years or how long. We are not particular about exact dates. A. It would be a mere guess. I have kept no track of the dates. I stepped so easily from one place to another that I do not recall the date when I was appointed general manager, or anything near it.

Q. Has it been within the past year? A. Oh, no.

Q. Several years ago? A. Yes.

1953 Q. You have been present while we have been taking testimony here in reference to the entry on page 76 of this book entitled "Statistics?" A. Most of the time; yes.

Q. Do you remember that when we were here taking testimony last January, counsel for the Chesapeake & Potomac Telephone Company inquired of you about that matter? A. Yes, sir.

Q. I want to ask you whether you have made search for the original paper, of which that appears to be a copy, and whether you found the original? A. I have made search. I have not found it.

Q. Have you any recollection about the particular paper, aside from what appears upon the book itself? A. No, sir.

Q. As general manager of the Michigan Telephone Company, are you able to inform us as to whether or not that company has been making any profits at the rates at which it has been doing business of late years? A. I am without authority to answer that question, without reference to my superior officer.

Q. Who is that superior officer? A. The President, Charles J. Glidden, of Lowell, Massachusetts.

Q. Have you, at our request, made application to him since we came here? A. Yes, sir.

1954 Q. With what result? A. That I was not to do so without further permission from him.

Q. How did you communicate with him? A. By telephone.

Q. Have your duties as general manager related to the business generally of the Michigan Telephone Company, or only to the Detroit exchange? A. Generally.

Q. Are you familiar with the operations of the Grand Rapids exchange of your company? A. Yes, sir.

Q. Are you able to tell us whether that company has been doing business at a profit or at a loss since it reduced its rates? A. Do you mean our company at that place?

Q. Yes. A. I can only make the same answer to that question as to the other, that I am without authority to refer to the books to give the information.

Q. Would the books which you keep show that fact, whether the business is done at a loss or at a profit, both at Detroit and at Grand Rapids? A. Yes, sir.

Q. Those books are in existence here in this office? A. Yes, sir.

Q. We make a formal request upon you to produce them, Mr. Forbes, in order that we may get the desired information. A. I shall have to decline to produce the books, under the circumstances.

1955 Q. Then I will ask you to state what the fact is, without reference to the books. A. I shall have to decline to do that also.

Q. Is the Michigan Telephone Company a part of the telephone system now? A. The organization has not been changed. It still stands alone as an organization.

Q. Are there other companies which now operate with it under the same general head? A. No, sir; they operate inde-

pendently, but under the same ownership as to a majority of the stock.

Q. What territory is covered by that joint ownership in that way, or common ownership, rather? A. Michigan, Cuyahoga County, Ohio, North and South Dakota, Texas, Minnesota and Wisconsin. Whether all of those States—I mean to say whether all the places in those States I have named—are operated by this ownership, I don't know.

Q. How many telehpone exchanges does the Michigan Telephone Company itself operate? A. About 110, as I remember it now.

Q. Does that company also have a long distance service of its own? A. Inter-town lines; yes, sir.

Q. Connecting its exchanges in Michigan? A. Yes, sir.

Q. Do subscribers to telephones in your exchanges have the use of your long distance system free, or do they
1956 pay an extra charge? A. As a rule, they pay an extra charge.

Q. Do you do business in any of the small towns on a commission basis? A. Yes, sir.

Q. Paying a commission to some person on the gross receipts? A. Yes, sir.

Q. Mr. Forbes, in the performance of your duties, do you have anything to do with the matter of operating the exchanges? A. Yes, sir.

Q. Can you tell us, in the experience of the Michigan Telephone Company, whether, as the number of subscribers in a particular exchange increases, the calls per subscriber increase or diminish, or remain about the same? A. The statistical information I have had has shown that it increases.

Q. Could you give us any figures on that as to the Detroit exchange, for instance, so that we could see what the increase is, in what proportion? A. The last figures I had, as I remember them now, showed that the calls per subscriber in the Detroit exchange—

Mr. BIRNEY: This is objected to, unless the figures are produced.

1957 A. (Continning) Averaged about fourteen, whilst in Grand Rapids, at the same time, they averaged about eight and one-half.

Q. What is the number of subscribers, about, in each of those exchanges at that time? A. 3,900 and 1,000 respectively, about --Detroit and Grand Rapids, in the order I have mentioned them.

Cross-examination.

By Mr. BIRNEY:

Q. At what time was that statement made? A. I don't remember the date.

Q. Can you tell about how long ago? A. About three years ago, as I remember it now.

Q. Have you had any statement since then? A. I think I have had statements from time to time, but I don't remember the figures. Those were impressed on my mind for some reason that I cannot recall at the present time; but I do remember those figures distinctly.

Q. How long has it been since you looked at those figures? A. I can't answer that question; I don't remember.

Q. Have you had occasion to look at them within the last year? A. No, sir.

Q. Have you looked at them within the past two years? A. I can't tell that.

1958 Q. Are they accessible to you so that you might now examine them readily? A. I think not, for the reason that I got a great deal of this information in penciled memoranda. It was probably put in a drawer, and after a time, in cleaning out the drawer, the use that I thought could be made of the papers had passed away, and I tore them up and threw them in the waste-basket.

Q. Do you know how that statement was made up—in what way the count was taken? A. The count was taken by the operators, and our then electrician compiled the report for me.

Q. Was that a formal report? A. No; informal.

Q. Did they go into your book of statistics? A. No, sir.

Q. You kept no record of it? A. That is, I don't remember that it went into the book of statistics.

Q. Have you recently had such a count taken in Detroit? A. Not for my purposes. I think a count of that kind is made, but I would have to ask about that. I think certain statistical reports that we make to the American Bell Telephone Company once a year cover that, if I am not mistaken. I can ascertain from a person in the room, perhaps. Am I right, Mr. Boothe?

Mr. BOOTHE: I don't know whether it is in that form or not —that is to say, the number of calls per subscriber.

1959 By Mr. BIRNEY:

Q. Can you not tell, Mr. Forbes, by looking at your last report to the American Bell Company? A. I could tell; yes.

Q. Will you do so? A. I would rather not, for the same rea-

son that I have stated before. I would like to submit all these things to the president—I mean to say, any information of that character.

Q. And for this reason you decline to look at the report to inform yourself upon this point? A. Yes, sir.

Q. And you, of course, decline to produce the report for my examination? A. Yes, sir.

F. A. FORBES.

Signature affixed by the Examiner, by consent of counsel.

The further taking of these depositions was thereupon adjourned, to meet in Fort Wayne, Indiana, on Tuesday, June 6th, 1899, at 11 o'clock.

1960 Wayne Hotel, Ft. Wayne, Indiana,

Tuesday, June 6th, 1899, 11 o'clock a. m.

Met pursuant to adjournment, at the Wayne Hotel, Ft. Wayne, Indiana.

Present on behalf of the complainants, Mr. Birney.

Present on behalf of the defendant, Mr. Wilson and Mr. Worthington.

THEODORE THORWALD, a witness heretofore examined on behalf of the complainants in this case, was recalled as a witness on behalf of the defendant in rebuttal, and examined

By Mr. WORTHINGTON:

Q. Mr. Thorwald, you were examined as a witness in this case last January? A. Yes, sir.

Q. Are you still connected with the Home Telephone Company of Ft. Wayne? A. No, sir.

Q. When did your connection with it cease? A. The 26th of February.

Q. Please state again here on the record what your connection with that company was, and how long it lasted? A. I was manager of the Home Telephone Company one year and assistant manager the year before. Before that I was solicitor for them.

1961 Q. While you were manager and assistant manager what in a general way were your duties? A. Overseeing the plant in general in regard to service and those things.

Q. Did you have anything to do with construction? A. Only just in a general way—to give orders what was to be done in the shape of putting up lines, or where telephones were to be placed.

Q. As to the work of operating the exchange, did you have charge of that? A. Yes, sir; and those things.

Q. During your connection with the company state whether or not you generally became acquainted with its method of doing business and its affairs? A. Yes, sir.

Q. How many exchanges had that company? A. Two exchanges, the main office and the south side.

Q. With about how many subscribers in each? A. There were 1,630 connected at the time I left. Of those there were about 450, I think, on the south side.

Q. Does that company use the multiple board in either of its exchanges? A. No, sir; the transfer system.

Q. How did that system work between those two exchanges?

Mr. BIRNEY: That is objected to as having been already gone over at great length with this witness in his previous examination.

1962 Q. What I want, Mr. Thorwald, is not so much the mechanical details as to know whether that arrangement of two exchanges gives satisfactory service to the subscribers. A. No; it complicates, naturally, the work of all the operators.

Q. To what extent, if at all, does it give rise to complaints from the subscribers to the smaller exchanges? A. One trouble is that there are duplicate numbers. Another trouble is that the operators in the main office naturally take care of their calls first, and then when the other calls come in from the other side, the south side, they have to wait until they get ready to give those calls. It makes it more complicated.

Q. Are there any complaints, and if so to what extent do they go, on account of delays arising from this double exchange? A. The complaint is that the people on the south side have the impression that they have to wait longer for service than they do in the main office. I think the principal trouble is that the two exchanges are too close together. The south side exchange was an experiment, on account of the party that was put here first to manage the plant, and they thought they could save money by putting in the south side exchange instead of running the lines all into here. I notice the same people have put up an exchange at Indianapolis, and although that is a good deal larger city, they have not put in any additional exchange, but simply put in one main exchange, which in itself would prove that this was not satisfactory to

1963 them.

Q. Are you acquainted with the operation of the multiple switchboard in a general way? A. I am only acquainted with them so far that I have seen them work, and I have no-

ticed that the operator at those boards can make her own connections instead of depending upon some other operator.

Q. What is your idea of the comparative efficiency of a system by which all the subscribers go to a central exchange with a multiple switchboard, and one in which they go to different exchanges and use the transfer system? A. My idea is that if I were to put up an exchange I would have it in one exchange and use a multiple board.

Q. Why would you do that? A. In the first place, I think you would have all your people taken care of at one place, and you could oversee it better, and naturally you could get better service that way than by dividing it around.

Q. What can you tell us as to whether the Home Telephone Company, during the time of your connection with it as manager, was making money?

Mr. BIRNEY: That is objected to as having been the subject of very elaborate cross-examination heretofore; on the further ground that it has already been made to appear that the financial results of the business of the company appear upon its books, and if this is to be gone into, the books should be produced. A. The facts are that when you take the amount of money that is collected for rentals annually, and as is done in this system, pay out the expenses of running the exchange, repairing what has to be repaired during the year, and renewing such work as has to be renewed, there is a surplus, which, last year, amounted to about twelve per cent. of the paid-in capital stock. Of course, in that estimate there is nothing laid back for depreciation of the plant, or renewing of the switchboard, or any part of it. There is nothing put back for the paying off of the bonds that are outstanding. I think that is about as close as I could give it. I feel as though that is about right.

1964

Q. From your experience in the telephone business, what is your judgment as to what is a proper allowance for depreciation of such a plant?

Mr. BIRNEY: Objected to, since it has not been shown that the witness has had sufficient experience to quality him as an expert on this subject.

A. My present idea is that, without doubt, the switchboard will have to be renewed or built over inside of ten years from the time the plant was built. Of course I don't know how much depreciation there is on the poles, or on the wire, or anything of that kind.

Q. You can tell us whether there is any depreciation? A. Yes; there is, but I don't believe I would want to say how much it would amount to. I would rather not say that.

Q. What is the result of your experience as to whether or not, as the number of subscribers in a telephone exchange increases, the cost of operating per subscriber increases or diminishes? A. My experience has been with the home
1965 company that when we had about 800 subscribers, the operators that had 100 subscribers each to take care of, could do it very easily; but as we increased the number of subscribers, the work became always harder for them, and they complained more on account of the increased number of calls that came in over their boards to and from the new subscribers, in addition to those they had.

Q. Do you know whether the Home Telephone Company has recently been endeavoring to increase the number of its subscribers or not? A. Ever since about a year we have not tried to increase them, only just what naturally would come to the company.

Q. Why? A. Because we felt we could get along better with less subscribers. That is my experience, and the experience they are having now.

Q. Do you know whether or not the Home Company has been issuing new stock recently? A. They have not issued any this year, so far.

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Thorwald, you say the business of the company resulted in a net profit of 12 per cent. or thereabouts. Was that after the payment of the interest on the bonds? A. No, sir.

Q. Was not the interest on the bonds charged
1966 against the receipts, so as to show a net result of 12 per cent.? A. No; the stockholders look at that as dividend.

Q. What do the stockholders have to do with the bondholders? A. The same people are the holders of the stock, unless they have sold their bonds. In July there was interest due, 3 per cent., and in January. Then in April and October they always declare the 3 per cent. dividend, making it 12 per cent. for the year.

Q. So then your answer did not refer to a sinking fund to take care of the bonds, but to interest as well. A. They have to pay the dividend, you know. I didn't mean that they did not take care of the interest in that. What I meant was that they didn't lay anything back so that when those bonds become due, which is in about eighteen years from now, they could pay them off.

Q. That is what I understood. A. But the 12 per cent. meant that they take the money out of this 12 per cent. to pay

the interest on the bonds; but the stockholders look upon that as a dividend for the money they have invested. The stockholder and the bondholders are the same thing.

Q. You have been been asked as to the increase of calls per subscriber. In your previous testimony, at pages 730 and 731, you testified that there were in the office of the company, and you produced, certain records of the number of calls per day made by the subscribers to the exchange, but they
1967 seem not to have been put in evidence. Have you now those calls, those records? A. No, sir; they belong to the Home Company.

Q. Can you remember what was the average number of calls per subscriber at the time your connection with the company ceased? A. We didn't keep track of calls that each subscriber made. We kept track of the calls that each operator got during the day.

Q. Then you took the aggregate of all those calls and ascertained in that way the number of calls made by all the subscribers, did you? A. Yes, sir.

Q. Did you not divide those by the number of subscribers to find out the average? A. No; we didn't do that. We were more anxious to find out how many calls every operator got, in order to find out whether they had too much to do. We found that some operators got as high as 150 calls an hour. Then, whenever we found their calls were getting too many, we had to make some different arrangement in order to relieve them.

Q. That is, you redistributed the work on the switchboard? A. The work as well as the pay. For instance, I can give you a specimen of that last year. Last year we didn't have any operator at the 700 board. The operators on the 800 and 600 board took care of that board, and their calls didn't average as much as the calls on the 100 board. This year we found that by having added on some subscribers we had to
1968 place another operator at the 700 board.

Q. The board No. 1 dealt with the business houses, did it not, almost exclusively? A. The fact is: When the Home Company commenced, they gave all the Bell people, the old subscribers, the same numbers they had before. Naturally all those boards were filled up. That is why those are the heaviest boards, and of course they are mostly the business boards.

Q. The business people are generally connected with the earlier boards, in Nos. 1, 2, and 3, are they not? A. No; because there is a whole lot of business men that never had a telephone until the rates were put down; but of course the wholesale houses and those places that did have telephones are all on the 400 and 500 boards.

Q. What class of subscribers is attached to the boards Nos. 6, 7 and 8? A. There are more residence telephones, of course, than there are of the others, because there are always more residence telephones come in than there are business telephones after you get to a certain number.

Q. The business houses are the first to connect with the telephone exchange ordinarily, are they not? A. Oh, yes; according to the rates.

Q. Your experience has shown you there are more calls from the business district or from the business telephones than there are from the residence telephones? A. Yes, sir; of course.

Q. Are you able to state the average number of calls per subscriber from your business houses as distinguished
1069 from the residences? A. No, sir; I wouldn't want to say that. We never kept track of it in that way.

Q. Can you give us the average number of daily calls at any time per subscriber, over your whole system? A. No; I don't believe I could give you that. The only thing that impressed me specially was whenever the calls got very heavy. That is the main thing. Of course if they didn't have more than a hundred on the average an hour, or something like that, we didn't think it was very serious, and of course paid no further attention.

Q. What is the average number of subscribers cared for by your operators? A. Do you mean how many on each board on the average?

Q. Yes; how many on each board on the average? A. There are 100 on each board, and as a rule, there are about ninety taken up. There are hardly ever less than ten that are vacant on a board.

Q. Then you have, as I understand from that and your previous answers, an operator at each board? A. They have an operator at each board now. Last year there were about three boards that we didn't have any operator on, that the alternate ones took care of.

Q. How many subscribers had you then? A. About 1,300.

Q. Your calculation was that each operator would take care of 100 subscribers? A. 100 subscribers. Of course when they had a board and a half, they took care of a little more than 100 subscribers; but the calls were not so many and it averaged about the same as those that had 100.

1070 Q. How many subscribers did the operators care for at the time you had 800 subscribers only; that is to say, what was the average number of subscribers cared for by each operator at that time? A. The switchboard was arranged for 100, you know, the same way.

Q. So there has been no change in that respect? A. There hasn't been any change; but there was serious contemplation of making a change if they could.

Q. I asked if there was one. A. No; there has not been any change made.

Q. An operator cared for 100 subscribers then, and each operator cares for 100 now? A. Yes.

Q. I think you testified before that you had had no experience with any other telephone company than this one. A. No, sir; I didn't have any experience with any other telephone. I don't mean by that that I haven't seen any other switchboards, or haven't seen any other exchanges.

Q. You have not operated, or taken part in the operation of any other exchange than this one? A. No; that is all.

Q. When was it you first entered the telephone business? A. I was made assistant manager just about two years ago from now, but I have been soliciting and working in that capacity for about half a year before that.

Q. As solicitor, you had no part in the management of the company, did you? A. No; I had no part in it, only
1971 reporting in regard to how the service was; that is all.

Redirect examination.

By Mr. WORTHINGTON:

Q. Mr. Thorwald, you say there are about 100 subscribers' lines to each board, and about 90, as a general rule, are in use? A. About 90. What I mean is that out of 100 there are usually some who move away or change; and there are trunk lines which are used just as well.

Q. Then as a matter of fact, each operator takes care of about 90 subscribers? A. About 90 subscribers.

By Mr. BIRNEY:

Q. And in addition to that, these trunk lines? A. These trunk lines. They are distributed on the whole board. There are 40 of them.

By Mr. WORTHINGTON:

Q. Does the system with the present number of subscribers result in any delay in the busy hours of the day? A. It naturally does, because, of course, the lines are often busy and the operators are often busy, and things like that. The more subscribers you have, of course, the busier it gets.

THEODORE THORWALD.

Signature affixed by Examiner by consent of counsel.

1972 EDGAR L. TAYLOR, a witness of lawful age, called by and on behalf of the defendant in rebuttal, having been first duly sworn, is examined.

Q. Mr. Taylor, where do you reside? A. At Fort Wayne.
Q. What is your business at present? A. Manager for the Central Union Telephone Company.
Q. Manager of what? A. Of the Fort Wayne District.
Q. What territory does that include? A. It includes the seven counties of Allen, Whitley, Kosciusko, Marshall, Wells, Adams and Huntington.
Q. How many exchanges are included within your bailiwick? A. But the one at Fort Wayne. The others are all toll stations.
Q. What territory does the Central Union Telephone Company operate in? A. The three State of Ohio, Indiana and Illinois.
Q. How many exchanges does that company operate in those three States? A. I can't say the exact number, but nearly 250, I think.
Q. Then the Fort Wayne business is but a small proportion of their whole business? A. Very small; yes, sir.
1973 Q. How long have you been their Fort Wayne manager? A. Since September of 1893.
Q. Have you more than one exchange here at Fort Wayne? A. Only one.
Q. How many subscribers? A. 792.
Q. About what is the average distance of your subscribers from your exchange? A. About three-quarters of a mile, as near as I can guess it now.
Q. Is your plant an overhead or underground one? A. Overhead.
Q. Is your company restricted in any way as to the part of the city in which it can extend its plant? A. Yes, sir; very materially.
Q. What is the limitation? A. It is difficult to tell what that is without showing you a map.
Q. I do not care for a minute description. A. There are certain streets and alleys—probably a third of the city.
Q. About what proportion of the available territory are you excluded from? A. You might say two-thirds would be a very ample amount.
Q. It already appears in evidence what the rates are charged by your company, but perhaps you had better restate them. A. Business $24 a year and residence $10.
1974 Q. How long have you been charging those rates? A. Two years.

Q. Do you have any subscribers who are furnished with the regular long distance equipment? A. Yes, sir.

Q. Complete copper wire circuits and solid back telephones? A. Yes, sir.

Q. How many? A. Do you want the entire number? That is, including the city telephones and fire department? They are free, you know.

Q. No; those which pay. A. About twenty-five.

Q. What rates do you charge for that particular equipment? A. $60 for business and $42 for residence.

Q. Where are the financial accounts of the Fort Wayne exchange kept? A. At Chicago.

Q. Do you have anything to do with the disbursements and receipts of the exchange? A. Only to the extent of collecting the rental and disbursing the salaries and operating expenses generally. The pay rolls are approved here.

Q. How is it as to material. Do you buy that? A. No; that is all furnished from our supply department at Chicago.

1975 Q. Where is the central office of the Central Union Telephone Company? A. For the entire system at Ashland Block, Chicago.

Q. Who is the person who is in charge of the bookkeeping there? A. W. S. Chapman is secretary and treasurer, and E. G. Corneau is our auditor.

Q. Do you have access to those books so that you know what they show in relation to receipts and expenditures on account of the Fort Wayne exchange? A. I have not.

Q. Are you able to state in a general way, from your knowledge of the receipts and disbursements of the business generally, whether the business is done at a profit or at a loss under the rates which you have mentioned? I refer, of course, to the Fort Wayne exchange? A. Without going into details, I would say—

Mr. BIRNEY: That is objected to, as it has already appeared that the witness has not access to the books and cannot know.

A. Without going into details, I would say that the business is not profitable.

Q. How clear is your judgment about that, from your knowledge of the expenditures and receipts, such as you have. A. I will base my reply upon the fact that our rentals are too low to justify a profit at the present time.

Q. Who fixes the rental which you are to charge your subscribers here? A. Our general officers at Chicago.

1976 Q. Have you any personal knowledge as to their reasons for fixing the rates at an unremunerative amount? A. Not farther than as a measure of necessity to protect our interests here.

Q. Explain what you mean by saying "protect your interests here." A. Having a plant here which has cost us considerable money, and it having pleased the other people, the other company, the independent company, to make rates lower than we were charging originally, and on account of our being restricted as to territory in which we could operate, we were reduced in point of subscribers below the other company, and we thought that we ought to offer some inducement to hold what we had.

Q. By "the other company" you mean the Home Telephone Company? A. The Home; yes, sir.

Q. Do you know whether or not that company has recently made application to the authorities here to be relieved from some of its taxes? A. They have.

Q. Was that application made in writing? A. Yes, sir

Q. Did you see the application? A. Yes, sir.

Q. Where was it on file? A. It was presented to the Council and referred to the proper committee. It was in the hands of the committee for a while, and then with-
1977 drawn.

Q. It has been withdrawn, has it? A. Yes, sir

Q. By whom? A. By the Home officials.

Q. Have you a copy of that paper? A. I have not at present. I did have one and sent it to Superintendent Vail.

Q. Do you remember the substance of the paper? A. Only imperfectly.

Q. Please state what you do remember as to the contents of that paper.

Mr. BIRNEY: Objected to as incompetent in every way, it not being shown that the original cannot be produced, and witness having already testified that he does not accurately remember the contents.

By Mr. WORTHINGTON:

Q. Do you remember the substance of it? A. The substance was that the Home Company was doing more for the city than the Central Union, inasmuch as it had agreed to pay a certain percentage of its receipts to the city, not commencing, however, until 1900; that it was putting in cables, in order to avoid cutting trees, and also stringing lines to distant points in the city to accommodate a few subscribers; that this caused its expenses to be very high, and they thought they should be relieved from the pole tax for this year, at least.

Q. How was that paper authenticated as emanating from the Home Telephone Company? A. It was, I believe,
1978 signed by the secretary.

Q. Who is he? A. At that time, Mr. Moellering, who is the manager now.

Q. Did you know his signature? A. No; I could not identify his signature.

Q. Was it received and acted on by the Council? A. It was acted on to the extent of being referred to a committee. There is no question of its having been presented to the Council as a matter of record.

Q. Have you been endeavoring to get your copy of that paper or a copy of that paper for us, to-day? A. Yes, sir; I have, and I hope to have it.

Q. You hope to have it before the day is over. A. Before the day is over.

Q. Were there any other signatures on that paper except that of the secretary of the Home Company? A. No signatures, no, sir; but there was a typewritten list of all the stockholders. It purported to have been endorsed by all the stockholders.

Q. Are those stockholders in the main citizens of Fort Wayne, or outsiders? A. All citizens of Fort Wayne.

Q. What is the name of the present president of the Home Telephone Company here? A. Charles S. Dash.

Q. And the secretary's name is what? A. There is a new secretary now. I cannot tell who it is. Mr. Moellering is the present manager. I cannot tell the name of the secretary now.

1979 Q. Who is the treasurer? A. I couldn't give that.

Q. Have they an auditor or anybody in charge of their bookkeeping department? A. No; I think not.

Q. Who has custody of their books; do you know? A. The manager and the bookkeeper.

Q. Do you know who is the bookkeeper? A. No, sir; I don't know his name.

Cross-examination.

By Mr. BIRNEY:

Q. About how long has the Home Telephone Company of Fort Wayne been in operation? A. Three years next October —about two years and a half.

Q. What were the rates charged by your company before that time? A. $48 for business and $30 for residence.

Q. How many telephones had you? A. About 650, I think, at that time.

A recess was taken at this point until 4:30 o'clock p. m.

1980 *After Recess.*

EDGAR L. TAYLOR resumed the stand for further examination.

By Mr. WILSON:

Q. Have you now the copy of the application made by the Home Company to be relieved from its pole tax? A. I have.
Q. Is that a correct copy? A. It is, yes, sir.

Mr. WILSON: The paper just identified by the witness is offered in evidence.

Mr. BIRNEY: Objected to, for the reason that the paper offered has not been proved to be a copy of any paper, nor has it been shown how the witness knows it to be a copy.

The said paper is as follows:

"In return for franchise privileges, the Home Telephone Company paid to the city of Fort Wayne the following:

Free 'phones in all city departments and in the residence of Chief of Fire Department, Chief of Police, total now so placed ————; ½ rate to all other city officials, the upper cross-arm of all its poles, one duct to hold 200 wires in all conduits for the city's use. After a certain period two per cent. of the gross receipts of the company.

Q. The company further agrees to place tubing for the city's use in all conduits built when it is not ordered by the city; limits the telephone rental for all times to come. In
1981 addition to this, the company instead of observing the usual rate, has made special low rate to railroad men, office clerks, etc., having now in use over 600 $12.00 'phones and 200 $18 'phones.

It has further not exacted from people living beyond the mile limit that they wait until five or more subscribers are secured on such lines, but has without limitations run lines to and beyond all limits out of the city without increasing the rates, frequently at an unusual expense and without a possibility of making profit.

It has promptly responded in running lines anywhere when subscribers living at great distance; has bought the best telephones it could get and repaired trouble promptly day and night. It has not destroyed growing shade trees to make room for its wires, but has endeavored to place its poles where property-owners found it the least objectionable. It gives employment to 50 people and all moneys are left in the city.

The Bell Company never would or did reach the people living beyond a certain radius, thus shutting out from telephones all who could not afford to buy inside property.

The Home Company paid as much city and county taxes in three years as the Bell Company did the first fifteen years of their existence."

1982 Cross-examination.

By Mr. BIRNEY:

Q. Who was the person who wrote the typewritten paper you have just offered? A. My stenographer.

Q. What is his name? A. Her name is Miss Nellie Williams.

Q. When was it made? A. About 1 o'clock.

Q. From what? A. From a reading of the copy of the original in the office of our superintendent at Indianapolis by telephone.

Q. Then you mean that some person in Indianapolis communicated with you by telephone or with your stenographer? A. Yes, sir.

Q. And that she afterwards produced this to you telling you it was a copy of what she had heard over the telephone? A. She told me that, yes, sir, and I know that it is an exact copy, because I read the original myself.

Q. When? A. About a month ago.

Q. Have you seen it since that time? A. Not the original, no, sir—not since that time, but I had a copy of it made, which I know is identical with the original.

Q. Where is that copy? A. That is at Indianapolis, as far as I know. I sent it to the superintendent.

1983 Q. When did you last see that? A. The day I mailed it, about a month ago.

Q. You have not compared the paper here offered in evidence with that paper? A. I have not, no, sir; because I haven't it with me.

Q. Did you commit to memory that paper? A. No, sir; not word for word.

Redirect examination.

By Mr. WILSON:

Q. Have you a copy of the ordinance of the Common Council of the city of Fort Wayne, passed the 14th of January, 1896, in relation to telephones, etc., in the city of Fort Wayne? A. Yes, sir; this is the ordinance, No. 45.

Q. Is that the ordinance that was printed under the authority of the Council? A. Yes, sir.

Mr. WILSON: I offer that ordinance in evidence.

Mr. BIRNEY: Objected to as wholly immaterial and irrelevant.

The said ordinance is filed herewith, marked Exhibit Taylor No. 1.

EDGAR L. TAYLOR.

Signature affixed by the Examiner, by consent of counsel.

The further taking of these depositions was thereupon adjourned, subject to notice.

Office of the Chesapeake & Potomac Telephone Company,

1984 14th and G streets, Northwest, Washington, D. C.

June 26th, 1899, 8 o'clock P. M.

Met pursuant to notice, at the office of the Chesapeake & Potomac Telephone Company.

Present on behalf of the complainants, Mr. BIRNEY and Mr. HEMPHILL.

Present on behalf of the defendant, Mr. WORTHINGTON.

AUGUSTUS P. CRENSHAW, a witness heretofore examined on behalf of the defendant, was recalled by the defendant in rebuttal, and examined.

By Mr. WORTHINGTON:

Q. Mr. Crenshaw, do you still hold the same position with the defendant company which you held when you were previously examined in this case? A. I do.

Q. Have you read the testimony of Francis W. Dunbar, taken at Chicago in this case on behalf of the complainants? A. I have.

Q. As illustrating Mr. Dunbar's abilities as an expert in telephone exchanges, will you tell me how far he is right, in your judgment, when, on pages 510 and 511, in giving the details of the cost of the proopsed telephone plant in Washington, he allows 140 poles to the mile, and makes his fig-
1985 ures accordingly. A. I should think it clearly proved that he never erected a pole line in his life.

Mr. BIRNEY: The answer is objected to as stating no matter of fact, but only the opinion of the witness as to another person.

By Mr. WORTHINGTON:

Q. I was about to ask why you say that? A. Because he estimates on erecting 140 poles to the mile. This would place the poles about 37 feet apart, which would be entirely unnecessary, very unsightly, and very expensive.

Q. What is the average or usual distance between tele-

phone poles in telephone exchanges everywhere, so far as you are acquainted with them? A. The standard adopted by this company and the local telephone companies generally is 35 poles to the mile, which is 150 feet apart. The standard adopted by the long distance telephone company is about 40 to the mile.

Q. How is it as to the telegraph poles? A. The telegraph lines vary from 33 to 35 to the mile.

Q. To what extent are you familiar with the distance between poles in telephone and telegraph systems throughout the United States generally? A. I have examined the lines throughout the United States in a number of cities. I have laid out and measured off an immense mileage in pole lines myself; and certainly, in my travels, I have never seen
1986 a line of poles anywhere with more than 50 poles to the mile, and I doubt very much whether I have seen any with as much as that.

Q. Have you examined the plants of what are known as the opposition companies, concerning which testimony has been taken in this case in Norfolk, Richmond, Detroit, Fort Wayne and Grand Rapids? A. I have.

Q. Mr. Dunbar, on page 430, in referring to a certain exhibit which had previously been put in evidence in this case in connection with your evidence, says that he finds that there are 132 duct miles of underground system in the defendant's plant in Washington, and that this is far in excess of the duct mileage required for 2,200 subscribers' stations in Washington; and that allowing on the average only 70 twisted pair conductors per duct, these 132 miles of duct would serve over 9,000 subscribers' stations. What have you to to say in reply to that criticism? A. The mileage of duct does not regulate the capacity of subscribers that could be furnished through that duct. It more regulates the amount of territory covered by the underground conduit, thereby putting a larger proportion of the construction underground than a smaller amount of duct mileage would place underground.

Q. In laying the underground conduit system in Washington under your supervision, what allowance, if any, has been made for increase of the business in the future?

Mr. BIRNEY: Objected to, for the reason that this matter has been fully covered by the examination of the witness in chief.

1987 A. In making the plans for an underground system, we always look ahead, and put in as many ducts as we think will be required in the next twenty or thirty years, allowing in all cases for a certain percentage of the conduit that will probably always remain unused, as it is impossible to

figure down to a fine point in which directions the growth is going to come.

Q. In that connection, I will pass from Mr. Dunbar a moment and ask what information you can give us as to Mr. Ahern's qualifications to testify as an expert in constructing telephone plants, when he says, on page 763:

"I am not aware of a single place in the United States "where an asphalt street is torn up to lay conduits. When "I speak about that, I mean lengthwise of the street. I do "not mean crosswise. Of course you may have to do that, or "you may have to go a block to get to another street."

A. I should say his experience was very limited; as for instance, in Washington we have over 40,000 feet of conduit laid, in changing which we had to cut that number of feet of sheet asphalt.

Q. During what years was that work done in Washington? A. That work was begun in 1891 and completed in 1897.

Q. Did you have anything to do with that work? A. I had entire charge of it.

Q. Can you tell us, in the first place, from your recollection, about what that work cost? A. The entire cost?

Q. Yes; I mean the work of replacing the asphalt pavements under which you say you laid these conduits.

1988 A. That work was done by the District government. We deposited the necessary money to pay for this work, and it cost about $35,000.

Q. Have you, at the request of counsel for the defendant, had prepared from the books of the Auditor of the District of Columbia, a statement showing the exact amount of these payments during that period? A. I have.

Q. Is this the statement (handing witness a paper)? A. Yes, sir.

Q. Is it correct? A. Yes, sir.

Mr. WORTHINGTON: Counsel for the defendant offers in evidence the above statement (informing counsel for the complainants at the same time that if they make any objections it in its present form, he will call from the Auditor's Office of the District the man who prepared it from the books), and the paper is herewith filed, marked Exhibit Crenshaw Rebuttal No. 1.

Mr. BIRNEY: We do not object to its form.

By Mr. WORTHINGTON:

Q. In doing the work covered by this exhibit, who fixes the price that shall be paid? A. The District Government.

Q. What has the defendant company to do with fixing the cost of this work? A. Nothing whatever, but to pay the bill.

Q. You deposit the money and the District does the work, and if there is anything left, it gives it back to you?
1989 A. Yes, sir.

Q. Is that what is meant by this balance at the foot of this exhibit, $390.60, that of the deposits shown on this paper, that is all there is left? A. Yes, sir.

Q. That stands there, ready to be credited on the next work of the same kind? A. Yes, sir.

Q. I would like to know what proportion, if any, of the asphalt pavement which is charged for in this exhibit stands to-day over the conduits of your company.

Mr. BIRNEY: That is objected to as not proper in rebuttal.

Q. In other words, I want to know whether this was done for some transient work or work of repair, or whether it stands now and represents what it would cost if somebody else were going to do the same thing to-day. A. That is the new pavement, as laid over the cuts we made.

Q. Are your conduits still there, and the pavements still over them? A. Yes, sir; the conduits are still there and the pavements still over them.

Q. To return to Mr. Dunbar. If, in laying these conduits you had provided only for the number of subscribers you then had, or a small additional number, and then the conduits on some one of the streets covered by this work had proved insufficient for the growth in that neighborhood, what would have been the consequence? A. We would have to
1990 tear up the pavement from all the conduit on such streets and add to our conduit capacity.

Q. The cost of that would have been what, in proportion to this—I mean per foot or per yard? A. Are you referring to the entire cost now or the cost of repaving?

Q. The cost of repaving. A. It would have simply doubled the cost of repaving, per lineal foot.

Q. How would it be as to the other work of laying the conduits, as compared with what you have already done? A. That is a little difficult question to answer, because it would depend on the capacity we added. If, in making our second addition, we then only allowed for the growth up to that time, it would cost very largely in excess per foot of duct, what the original conduit cost.

Q. Referring now to the estimate made by Mr. Dunbar and others in testifying for the omplainants as to the probable cost of construction of a telephone plant in Washington, I would like to ask you what is, in the District of Columbia, the average distance from your central exchange of your subscribers? A. About one and nine-tenths miles.

Q. It appears from the evidence in this case that that is

from ten to three times greater than that in other cities which have been testified about. How do you account for that? A.

1991 In the first place, Washington is a city of magnificent distances. A great deal of its space is taken up by parks and wide streets. The business center of Washington is not as concentrated as it is in most cities, extending, as it does, from Georgetown to the Navy Yard, and from the foot of 7th street to the head of 7th street. As a comparison, the area of Washington was greater than the area of Baltimore prior to Baltimore taking in the Belt.

Q. Taking in what? A. What is called the Belt, even though the population of Baltimore at that time was about twice the population of Washington. I obtained this information from the fact that I had my engineer prepare a map of each city on the same scale, and I was very much surprised to find that Washington would not get on the same sized map that Baltimore did get on.

Q. Although Baltimore had twice the population? A. About twice the population.

Q. On page 508 the same gentleman, Mr. Dunbar, states, and gives the reasons why, he has allowed only 25 or 30 manholes in the plan, the cost of which he estimates in Washington. What do you say as to 25 or 30 manholes being sufficient for a plant covering the ground which the plant of the defendant company covers in the District? A. 25 or 30 manholes placed in the present conduit of this company, covering the same streets that this company's present conduit does cover, would place those manholes about 2,400 feet apart; and, leaving out the impossibility of doing so, from obstructions met with in the streets, it would be impossible to pull a cable that distance.

1992 Q. What is the limit of distance within which, by any ordinary means, a cable can be pulled through from one manhole to another? A. 700 feet is considered an extreme measurement. The average is between 300 and 350 feet.

Q. On page 510, Mr. Dunbar states that he allows from $85 to $95 for the construction of each of these 25 or 30 manholes. What do you say as to the reasonableness of that estimate? A. It would depend a good deal on the size of the conduit. I imagine, from Mr. Dunbar's estimate, that his conduit is of an exceedingly small cable capacity. He might, under those conditions, build a manhole to suit such a conduit for the price named.

Q. How would it be with such conduit capacity as you have here? A. It would not answer except in the smaller branch conduits.

Q What do your manholes cost, in the average? A. $143.

Q. On pages 434 and 435 there is an estimate which Mr. Dunbar prepared as to the cost of establishing a telephone plant in Washington; and I find, by reference to page 435, that he allows $42,450 for the cost of cables in his proposed system, and only $25,000 for the cost of the ducts. What do you say as to that being a proper proportion between cost of cable and cost of ducts? A. With a small duct capacity, and each duct being equipped with a large cable, say 125 or 150 pair, that
1993 proportion could hold.

Q. Do you know any telephone plant that is constructed that way? A. No, sir.

Q. What would be the proportion in the conduits and cables where ordinary reasonable room is left for future growth in different directions, without relaying the conduits? A. The conduits complete, including the manholes, would cost nearly three times as much as the cables.

Q. On the same page 435, Mr. Dunbar allows, as the cost of overhead and aerial construction for 2,200 subscribers, metallic circuit lines, including poles, wire, stringing the wire, setting the poles and also the cables when advantageous to use them, the sum of $41,000. What would you say with reference to that as a reasonable and necessary cost of the poles alone in your plant here in Washington? A. I should say that was much less than the cost of just my poles, and that that would not pretend to supply the subscribers if they were located in the scattered condition in which our subscribers are located.

Q. How do you figure out that your poles alone cost more than the $41,000 which he allows for the whole overhead plant? A. I made a statement showing the cost of our poles being $43,770.93, without the cross-arms or any equipment.

Q. Have you the details of that statement? A. Yes,
1994 sir; that is submitted in my statement called, I think, Exhibit L.

Q. Speaking of poles, we have had a good deal of testimony as to the cost of the poles that are in use in what are called the opposition plants in Richmond, Norfolk, Fort Wayne, and so on. Have you read those statements? A. I have.

Q. Have you recently had particular occasion to inquire into the cost of poles here now? A. Yes, sir.

Q. What brought it about, and what is the result? A. The price on poles has continually risen, on account of the chestnut timber that we use here becoming scarce and hard to get under the specifications under which it is required to be furnished. I have, therefore, taken up the question of purchasing creosoted poles, which is a yellow pine pole, treated with dead oil of coal tar, which makes equally as good, and possibly a better, pole than the chestnut pole, in that the life is supposed to be longer.

Q. What will those poles cost, according to the height? Give us the figures. A. A 25-foot pole will cost $7.40; a 30-foot pole will cost $7.95; a 35-foot pole will cost $9.45; a 40-foot pole will cost $11; a 45-foot pole will cost $12.60; a 50-foot pole will cost $14.50; a 55-foot pole will cost $16.50; a 60-foot pole will cost $21; a 65-foot pole will cost $26; a 70-foot pole will cost $31.90; a 75-foot pole will cost $35.62; an 80-foot pole will cost $40. These prices are for the poles delivered by rafts at the wharf at Washington.

1995 Q. Can you not get serviceable poles cheaper than that here now? A. We can of the shorter lengths. The chestnut poles from 70 feet up are costing pretty near these figures.

Q. There has been some criticism in the evidence here about the use of poles that are unnecessarily high and expensive. How is that regulated here in the city? A. The law requires this company to erect poles of such height that the wires will be not nearer than 50 feet from the ground.

Q. You mean an act of Congress? A. An act of Congress; yes, sir.

Q. If you comply with that regulation and have your lowest wires 50 feet from the surfact of the earth, how long must your pole be? A. The pole must be at least 60 feet in length.

Q. Why do you have poles that are longer than that, some of them? A. Because in a good many cases we have to string them over buildings and trees and other obstructions that require us to go more than 50 feet from the ground.

Q. Do you use those longer poles in any case except where some such difficulty requires it? A. No. That is, only where those difficulties force us to use it, and the number of wires carried on the poles forces the wires to be much higher than 50 feet from the ground. The act requires that the lowest wire on the poles shall be 50 feet from the ground.

1996 Q. That is what I meant when I asked you how high your pole must be in order that the lowest wire must be 50 feet from the ground? A. Of course that would be governed by the number of wires carried. It would be from 60 to 80 feet.

Q. While on this subject, let me refer you to the testimony of Mr. Keelyn, on page 614, who says that when he was in Washington he saw, near the corner of 14th street and Pennsylvania avenue a pole which was squared and octagonal. Can you tell me about the poles of your company down on that corner? A. This company has no pole at all near that corner, nor has it any poles in any portion of this territory, either squared or octagonal.

Q. Do you know to whom the poles which he saw belong? A. I judge it belonged to the Electric Light Company. The

Western Union has some large poles at that point, but they are not squared or octagonal.

Q. While still on the subject of telegraph poles and overhead construction will you tell me whether you recently went to Grand Rapids at the request of counsel for the defendant in this case? A. I did.

Q. Did you examine there the plant of what is called the Michigan Telephone Company and also the plant of the Citizens' Telephone Company in that city? A. I did.

1997 Q. Did you, at our request, have some photographs made illustrating the construction of the Citizens' Telephone Company plant? A. I did.

Q. How did you know that the poles and wire to which you refer belonged to the Citizens' Telephone Company and not the Michigan Telephone Company? A. I went over the ground with Mr. Berry, the superintendent of the Michigan Telephone Company, and also followed the wires and cables from the Citizens' Telephone Company office out in the different directions.

Q. State, then, whether or not you are able to say that the poles and wires which you had photographed were connected with the office of the Citizens' Telephone Company, without any reference to what Mr. Berry told you? A. I can.

Q. Please look at this photograph, which bears the label, "showing lines of the Citizens' Telephone Company, Grand Rapids, Michigan—East Fulton, Waterloo and Ellsworth avenue," and tell me whether or not that is one of the photographs you speak of, and whether or not that is an accurate representation of this portion of the plant of the Citizens' Telephone Company referred to in the label. A. It is.

(Counsel for the defendant here offer in evidence the photograph referred to, and it is filed herewith, marked "Exhibit Crenshaw Rebuttal No. 2.")

Q. Please look at this photograph, which is labeled,
1998 "Showing pole lines of the Citizens' Telephone Company, Grand Rapids, Michigan, Louis, Ottawa and Tampau streets," and state whether or not that is another of the photographs of which you have spoken, and whether it is a correct representation of that portion of the plant of the Citizens' Telephone Company in Grand Rapids? A. It is.

(Counsel for the defendant also offer in evidence the photograph just referred to, and it is filed herewith, marked Exhibit Crenshaw Rebuttal No. 3.")

Q. Please look at this photograph, labeled, "Showing entrance of cables into the Exchange Building of the Citizens' Telephone Company, Grand Rapids, Michigan," and state whether or not that is another of the photographs to which you

have referred, and whether the overhead construction on the left-hand side of the picture is a correct representation of the poles and wires of the Citizens' Telephone Company at that point, and whether the poles on the right-hand side of the street picture are correct representations of a corresponding part of the plant of the Michigan Telephone Company in Grand Rapids? A. That is correct.

(The photograph just referred to is offered in evidence by counsel for the defendant, and is filed herewith, marked "Exhibit Crenshaw Rebuttal No. 4.")

Q. Without taking up too much time with this matter, please take the first of these photographs, Exhibit Crenshaw Rebuttal No. 2, and tell me as an expert in these matters what you
1999 think of that as a sample of overhead construction to be adopted in Washington? A. I think, both from the point of view of being a telephone expert and an interested citizen in Washington, I should hate to see that class of construction put up here.

Q. Leaving out our views as citizens, what is the matter with it from a telephone expert's point of view? A. It is very frail. The poles are very much overloaded with cables and wire, and during a sleet storm or heavy wind storm would be liable to fall in the street.

Q. Point out in detail how it might be improved and made to correspond with your Washington overhead plant? A. The only way it could be made to correspond with my overhead Washington plant would be to place it underground, carrying the large bulk of the wires underground and using smaller and more sightly poles and stronger poles for distributing purposes.

Q. In the city of Washington, including Georgetown and the closely built up portion of the suburbs, what is the proportion of underground plant to overhead plant of your company, as nearly as you can give it? A. In miles of wire or dollars and cents?

Q. Both, if you can give it. A. I can probably give it approximately either way. (After calculating.) The proportionate cost of the underground system in Washington, as compared with the overhead system in Washington, is about four times as great. The proportionate mileage of wire overhead and underground within the city of Washington is three-
2000 quarters underground and one-quarter overhead.

Q. You have said that the average distance from the central office of your subscribers in the District of Columbia is one and nine-tenths miles. What proportion of that average distance is underground and what proportion overhead? A. There is one and one-tenth mile underground and eight-tenths of a mile overhead. That remark of mine referring to one and

nine-tenths miles refers to the whole distance, not to the city alone.

Q. What different kinds of pavement, and what proportion of each, has the defendant company taken up and relaid or paid the cost of relaying in establishing that part of its underground system which is in existence and in use to-day? A. The number of lineal feet of sheet asphalt pavement is 49,143 feet 6½ inches; stone pavement, 16,545 feet 2 inches; Belgian block pavement, 7,596 feet; brick sidewalk, 4,785 feet 1 inch; asphalt block, 1,693 feet; making a total of 79,752 feet 9½ inches, or 61.3 per cent. of the total being sheet asphalt. However, as 19,415 feet 4 inches of the total trench measurement is in branches, very little of it is paved with asphalt. Leaving out these branches it makes about 80 per cent. of the main conduits that had to be laid under asphalt pavements.

Q. One of the witnesses for the complainant has testified that the cost of replacing a brick pavement after relaying the conduit was greater than the cost of laying an asphalt pavement. What does your experience teach you as to that? A.
2001 My personal experience in relaying pavements over our conduits, as far as brick is concerned, has only been in connection with sidewalks, which, of course, are very much cheaper than sheet asphalt.

Q. You do not know, then, of your own knowledge, what the comparative cost is as between asphalt and brick proper? A. Not of my own knowledge.

Q. What is the distance between the tops of your conduits or of the cement which covers the conduits and the surface of the street? A. About 30 inches—30 inches or deeper.

Q. Please describe now in a general way the plant of the Citizens' Telephone Company of Grand Rapids, and the date of your inspection of it. A. I can to-night only give the date as between the 20th and 25th of May, 1899.

Q. That is near enough. A. I found the pole lines of the Citizens' Telephone Company in Grand Rapids in very bad condition. The poles are very slim, the majority of the long ones being spliced, that is, two poles spliced together to attain the required height, which is very poor construction at best, even for a light line, but for carrying the load that had been placed upon these poles I consider it absolutely dangerous. My opinion is that should a sleet or wind storm take place in Grand Rapids it would throw that company temporarily out of business, as I not only think that a large number of their
2002 pole lines carrying heavy cables would go down, but that they would cause an immense amount of damage to other property in the city.

Q. Did you inspect at about the same time the plant of the

Home Telephone Company in Fort Wayne, Indiana? A. I did.

Q. Please give us a general description of that plant as you saw it? A. The pole lines generally belonging to the Home Telephone Company in Fort Wayne are in a very dilapidated condition, considering they are only about three years old. The poles are overloaded in a great many cases, and the wires are badly in the trees. The guying is of a very light and poor quality. The wires are led or bridled from one portion of the pole to the other, so as to, as far as possible, keep them from crossing.

Q. Explain what you mean by being bridled? A. Tied. The poles are small at the top, and do not appear to have been delivered under any special specification. The wire in use in Fort Wayne is of a small gauge copper, the joints in which are what are called the twisted joint and not the McIntyre, as should be used on all good construction.

Q. Explain the difference between the two joints. A. A twisted joint is simply a joint with two ends of the wire wrapping around each other, which is subject to corrosion. The McIntyre joint is made by inserting two ends of the wire to be joined together, one on each side of a copper sleeve. The sleeve is then twisted up, which makes a water-tight, air-tight
2003 and non-corrosive joint. While in Fort Wayne I visited the pole yard of the Home Telephone Company, and measured a great number of the poles on the yard. The tops averaged about 5 inches in diameter and the butts from 8 to 10 inches in diameter. This is much smaller than poles should be to put up good construction. The cable boxes for distributing the aerial and underground cables of the line wires are very frail and cheap. There appeared to be no protection in a great many of the boxes from lightning or high potential currents. There is no ground wire used in these cable poles to carry the current into the ground. The manholes used in connection with the underground conduits are very small, resembling a small sewer-trap. There is no means of either locking these manholes or keeping out street drainage. I should judge such covers could be bought for about $3 apiece.

Q. You might state right there what those of your company cost. A. The cheapest cover that we have used on any of our conduits cost $24, the average cover costing about $35. On these poles there are quite a large number of aerial cables which are put up in very bad shape, the guys supporting the cable being very slack and also very small. The poles are pulled very much out of shape on account of the indifferent guying.

Q. Did you also examine about the same time the plant
2004 of the Detroit Telephone Company in Detroit? A. I did.

Q. Please state your observations as to that. A. I

found the pole lines of the Detroit Company in very bad shape, being very much overloaded with line wire and aerial cable. It is my opinion that they should at least double the mileage of underground cable and reduce to this extent the heavily and badly constructed pole line. Within what they call the underground mile circle their plan is to run an underground conduit and cable into an alley or on a convenient street, if there is no alley in the square, and distribute into the houses overhead from this point. This is somewhat similar to the mode of distribution of the company in Washington.

Q. You mean of the Chesapeake & Potomac Telephone Company? A. The Chesapeake & Potomac Company's mode of distribution in Washington, except that the class of distribution, including the poles, boxes and wires is very inferior and of a cheap quality. For instance, the majority of their poles within this section are from 25 to 40 feet in height.

Q. Does that mean from the ground or the whole pole? A. The whole pole. The cable boxes are very small and flimsy, with wooden platform. The cable poles have cross-arms on them instead of tower rings, and the wire is of a cheap grade of No. 14 iron or steel.

Q. What is a tower ring and what is its advantage? A. A tower ring is a circular iron distributing ring, from which the wires radiate in all directions.

2005 Q. What advantages has it over their system? A. It has the advantage of lasting very much longer and of making a very much better distribution from a cross-arm. Unless a subscriber lives directly in front of or behind the arm, he will have to run off at such an angle that it brings the wires very close together, which is obviated by the circular distribution.

Q. What harm does it do to have the wires close together? A. They are apt to get crossed, by coming in contact with each other. The wire used in this distribution is a cheap grade of 14 iron or steel, and appears to be very rusty, although it has only been in use about three years. Shall I mention any of the points at which I noticed this?

Q. Yes, some of them. A. I noticed this class of distribution especially in the squares bounded by Washington and Roland and State and Clifford street; also between Roland and Griswold and Michigan Avenue and State street; also between Griswold, Woodward, Michigan Avenue and State streets; all of these streets being located in the very heart of the city. In the outlying portion of Detroit, or what is considered outside of the mile circle, I found the pole lines in a very much overcrowded condition, the poles carrying in some cases from 300 to 500 wires, either on arms or in aerial cables.

In the alley west of Gratiot street, between Antoine and Revard streets, the cable pole on which the underground cables terminated carried a 100-pair cable and a 50-pair cable with two ten pin cross-arms on the pole, the pole being very
2006 light, only having about a 6-inch top. This line, going south carried ten arms with porcelain knobs under some of the arms, together with two aerial cables. In crossing Stromberg's Brewery, the lines are in very bad shape, being carried principally in aerial cables attached to the roof of the brewery. At the corner of Marion and Revard streets, going east, the pole has eight ten pin arms, guyed with three No. 6 iron wires, whereas it should be twisted guy wires. There are no ground wires on any of the cable poles, apparently.

Q. What is the use of a ground wire in a cable pole? A. As I stated before, to carry off the high potential currents or lightning, and keep it from going into the cable.

Q. That is sufficient in the way of specification as to the Detroit plant. You went with counsel for the defendant to Richmond and Norfolk when testimony was taken there on behalf of the complainants in this case? A. Yes, sir.

Q. While in Richmond did you inspect the plant of the Richmond Telephone Company? A. Yes, sir.

Q. And while in Norfolk, the plant of the Southern States Telephone Company? A. I did.

Q. Please describe, in a general way, that Richmond plant, in the first place. A. The Richmond plant is entirely overhead, the wires being carried in aerial cables, together with line wire on the poles, and the poles are as a rule very small—that is, in diameter—at the top and butt. They
2007 carry from four to six ten pin arms with extra knobs and very few guys. The wire used is a cheap quality of No. 14 steel. In what they class as the business section of the city, they use tall poles, about 60 feet in height, on which are carried a large number of aerial cables.

Q. Is there any objection to carrying aerial cables on poles? A. I prefer to carry that number of wires underground; but if they are to be carried on poles, they should be carried on stout poles, properly guyed, which is not the case in Richmond.

Q. Why should they be carried in that way? A. To keep the poles from breaking off or doing damage, as the poles become seven or eight or ten years old.

Q. Do you know the weight per foot of such cables as they carry on their poles down there? A. I can only approximate it, because I do not know the diameter of their cable.

Q. Approximately, what is it? A. It weighs about 2½

pounds per foot, but of course this puts a very much greater weight than this on the pole, as it is the strain pulling the pole with the guy. It is not a direct down strain.

Q. Proceed with the Richmond plant. A. In the alley between Franklin and Grace, from North Third street west, there is a line of small poles carrying from four to six ten pin arms, with extra knobs under the arm. The poles are not guyed. At one heavy angle the pole is guyed with
2008 three small single wires to a very small pole at the alley and Third street. The line is pulled very much out of shape, the wires being very slack.

Q. What wires; the guy wires? A. The line wires. In the alley north of Broadway, the aerial cable enters the sub-exchange, being located between No. 211 and 209 East Broadway. The poles and cable are put up in a very slipshod manner, one large aerial cable entering the sub-exchange. The cable pole is very poor, being about 55 feet in height, with about a six-inch top and small butt, arms and wires in very poor condition; no tower equipment on cable pole.

The aerial line in the alley south of Main street and east of Third street is in very bad shape. One angle pole west of Fifth street leans over very badly on account of improper guying. The cross-arms, where braced at all, as a rule are braced with iron braces, not galvanized, and a good many of the wires are carried on knobs.

Q. Please describe in the same general way the plant at Norfolk of the Southern States Telephone Company. A. The class of pole lines in Norfolk is rather better than those in any of the other places that I have this evening described. Although some of them are very much overcrowded apparently from having taken more subscribers than they were originally built for, their pole lines carrying considerably more than 100 aerial line wires, besides the aerial cables being on them. The line on Cumberland street carries 120 line wires. The poles are principally of juniper. The poles, as a rule,
2009 are very short, the wires clearing the ground by about 30 feet. The plant is only about two and a half years old, and has stood up fairly well, so far.

Q. Take those several overhead plants you have described in Grand Rapids, Detroit, Fort Wayne, Richmond and Norfolk, and what do you say as to the probable life time of such plants as those? A. I should think the Norfolk plant would last six years: the Richmond plant possibly from five to six years; the majority of the Grand Rapids plant I do not think will last four and a half years from the time it was constructed. The Detroit plant will probably last from about five to six years. The Fort Wayne plant will last about six years.

Q. In several instances you have spoken of the large number of wires carried on some poles in these cities. What is the proper and safe load for telephone poles to carry? State it with reference to the different sizes of the poles and also with reference to cables being added to the wires. A. In constructing a pole line, it is constructed not so much with reference to what it has to carry in the first two or three years of its life, because it is at its strongest then, but with reference to whether it will bear the burden up to its average life of from eight to ten years. In that case, from my experience, I do not think any pole line should be built with a less diameter of the top than eight inches, and even in that case there should be a butt specification, which is governed by the height of the pole.

2010 Q. How does that requirement as to the butt run with different sizes of poles? A. The butt specification is always given in circumference at a point 6 feet from the butt, in inches. On a 25-foot pole the butt specification should be 33 inches.

Mr. BIRNEY: Counsel for the complainant requests the Examiner to note that the witness is now reading from a paper.

By Mr. WORTHINGTON:

Q. Please state what the paper is which you hold in your hand. A. A copy of my specifications under which all poles furnished to this company are received.

Q. Now proceed. A. On a 30-foot pole, the butt specification should be 35 inches.

On 35-foot pole, 38 inches.
On a 40-foot, 40 inches.
On a 45-foot pole, 43 inches.
On a 50-foot pole, 47 inches.
On a 55-foot pole, 51 inches.
On a 60-foot pole, 54 inches.
On a 65-foot pole, 58 inches.
On a 70-foot pole, 61 inches.
On a 75-foot pole, 64 inches.
On an 80-foot pole, 66 inches.
On an 85-foot pole, 69 inches.
On a 90-foot pole, 72 inches.

2011 All poles having a 25 inch circumference at the top.

Q. What load do you carry on your poles here in the District of Columbia? A. Of course that varies in different sections of the city. Our plan is to carry our underground conduits far enough to make the load on our poles not over 100 wires. There are a few exceptions to this rule on account of Congress having limited us as to laying conduit. We cannot

carry the conduit in some cases as far as we would like to. The heaviest line we have carries about 100 line wires and 100 wires in aerial cables.

Q. When a pole line has been constructed, and by the gradual increase of telephones along the line, a maximum number of wires has been placed on it, either in wires or cable, and additional subscribers come along and have to be supplied in the same neighborhoods, what is required, by a safe and prudent course, to be pursued in reference to it?

Mr. BIRNEY: Objected to as not matter in rebuttal, in any way.

A. We should, if the law would allow us, extend our underground conduits and cables farther out on that pole
2012 line.

Q. Suppose you either cannot, or you are not disposed to extend your conduits, and you are confined to and overhead system?

Mr. BIRNEY: Objected to for the reason that it has not been shown that such a condition of affairs has ever existed in any case within the knowledge of the witness.

A. Then we should attempt to build an additional pole line.

Q. If, in order to save the cost of construction of the additional pole line, you keep on adding to the poles which already have their proper burden, additional wires from time to time; what must be the result in the end if that process is kept up indefinitely? A. The result would be that that line would be over-burdened, and dangerous, liable to fall down or break down during a wind storm or sleet storm.

Q. In your travels that you have described, did you find any poles in that condition? A. I did.

Q. Where? A. In Grand Rapids and in Detroit—in those two places especially. Fort Wayne was in a dangerous condition in some respects, as was Richmond.

Q. What do you say as to resorting to the expedient of splicing a pole? A. I think that a pole carrying a heavy load as it carried upon the poles referred to in Grand Rapids as being spliced, makes it exceedingly dangerous, as a spliced
pole cannot be as strong as a solid pole.
2013 Q. Is it cheap? I mean, taking the first cost of the pole, is it cheaper to splice it than it is to get a pole of the same length, which is not spliced? A. I should not think so. I should think it was as cheap to buy the pole with a splice.

Q. Have you examined the specimens of wire which were put in evidence in connection with the testimony of the witnesses Robertson and Pannill? A. I have.

Q. What do you say as to the character of those two specimens of wire for use in an overhead telephone system? A. It was what is known as a cheap grade of iron wire, and is not considered good construction.

Q. Why is it not as good as more expensive wire? A. Because it rusts and deteriorates very much more rapidly, thereby making the subscriber's service poorer.

Q. Since you gave your testimony in this case, and filed an estimate of the cost of reproducing the plant of the defendant company as it exists in the District to-day, has there been any change in the prices of materials which enter into such construction? A. The prices of practically all of the overhead construction have increased.

Q. Take copper wire, for instance. A. Copper wire has increased about one-third.

Q. How as to the other elements of overhead construction? A. Poles have increased about ten per cent. Galvanized material, such as cross-arm braces, bolts, etc., have increased about twenty-five per cent. Cross-arms have increased about ten per cent. Aerial cable has increased about fifteen per cent.

2014

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Crenshaw, you have given the cost of creosoted pine poles of various lengths. How many poles, eighty feet long, are there in the systems of the Chesapeake and Potomac Telephone Company, of Washington? A. I can only approximate that. I should say in the neighborhood of sixty.

Q. Have you no record which would show exactly? A. No, sir; the only record I could get would be to look over the bills of the last ten years, and see how many of those poles we purchased.

Q. How many are there seventy-five feet long? A. I should have to give that in the same way. I should think there were at least one hundred.

Q. Have you no record of them? A. No separate record; no, sir.

Q. How many are there seventy feet long? A. I should think about two hundred. They are used almost entirely as cable poles.

Q. That is, as distributing poles for cables? A. Distributing poles. I did not mean to say they were used entirely as distributing poles. The distributing poles are almost entirely seventies. There are a good many seventies used outside of the distributing poles.

Q. Have you given us heretofore the entire number
2015 of poles in use in the District? A. I have.

Q. Do you recall the number? A. My recollection is that there are fourteen hundred within the city and nine hundred outside the city, within the District.

Q. You have said something of an Act of Congress limiting the height of the lowest wires on the poles. What statute is that? Can you give us the date? A. It is quoted, and the date is given, in my testimony heretofore. I do not recall the date.

Q. Is it your understanding that that statute applies to the whole District of Columbia? A. It is not.

Q. How far does it apply? A. It applies to the city.

Q. What regulation or rule is there as to the height of wires outside of the city proper?. A. There is no rule fixed by Congress. The Commissioners, in granting permits, say that the wires shall clear the roadways forty-five feet—

Q. (Interrupting) If you are speaking now from recollection of a document, a permit from the Commissioners, I should prefer that you produce it. A. I had not finished my answer. Several permits have been issued with such a clause in them, stating that we should clear the roadway by forty-five feet. That has not been the general rule, nor is there any absolute law or measurement on that subject. In other words, we are not limited to height, outside the city.

2016 Q. What is the height of the poles you use outside of the city? A. They vary from twenty-five to fifty feet, the majority being from thirty-five to forty-five feet.

Q. What is the average distance of the subscribers within the city from the exchange?

Mr. WORTHINGTON: Do you include Georgetown in the city?

Mr. BIRNEY: Yes.

A. About a mile and a half.

Q. In this estimate, do you include Georgetown? A. I do.

Q. How many subscribers are there in Georgetown, approximately? A. There are approximately seventy.

Q. Excluding Georgetown, what is the average distance of subscribers from the exchange, within the city of Washington? A. It would be affected very slightly. Possibly it would be about a mile and three-tenths to a mile and four-tenths.

Q. When conduits are constructed in streets paved with sheet asphalt, are those conduits now ordinarily built under the asphalt or under the sidewalk? A. Under the asphalt.

Q. Are not some conduits, in certain streets, constructed under the sidewalks? A. I have made a statement showing just how much that is. There is one case of that kind in Georgetown on M street, from 29th to 31st, where we could

not get into the street on account of the large water pipe, and the Commissioners directed us to lay in the side-
2017 walk. Our authority is always given to go in the roadway, and we cannot, without special permission or direction of the Commissioners, lay conduit in the sidewalk.

Q. Do the Commissioners object to your laying it under the sidewalk? A. Yes, sir; it interferes with vaults, and they reserve the sidewalks for sewer drainage from the houses, and so forth.

Q. When Mr. Dunbar testified that with the extent of duct in the conduits shown by your statement contained in your former testimony, at least 9,000 subscribers could be served if larger cables could be put in, he testified correctly, did he not? A. No, sir.

Q. How many do you think could be served? A. Our ultimate capacity, if we could fill up every duct with a cable, and every conductor in each cable with a subscriber, would amount to 5,600.

Q. What size cables do you employ in that case? A. One hundred pair.

Q. Does that take into consideration the continued use of the smaller cables which you have now in many of your ducts? A. It does not. The smaller cables would have to be replaced with larger ones.

Q. How many subscribers do you understand are now served through your underground system? A. About 2,400 at this present time.

Q. Has the duct capacity been increased since your last testimony? A. No, sir.

2018 Q. Are the ducts all capable of carrying one hundred pair cables? A. No, sir.

Q. Is there a difference in the size of the duct? A. There is.

Q. What is the difference? A. They are from three inches to four and a quarter inches.

Q. Will not a three-inch duct carry a one hundred pair cable? A. A three-inch duct will carry a one hundred pair cable. The conduits as originally laid in Washington were laid in angular sections of terra cotta pipe, each partition being designed to carry two cables of fifty pair each. That space that is laid out for two fifty pair cables will not carry two one hundred pair cables, on account of the one hundred pair cables, of course, being larger than the fifty pair.

Q. Is not the orifice of the duct large enough to carry the one hundred pair cable? A. It is large enough to carry one one hundred pair cable, but it would not carry two, whereas it would carry two fifty pair. Therefore we cannot double the capacity of our conduit by doubling the capacity of the cable.

Q. Would it carry one one hundred and fifty pair? A. It would carry possibly one one hundred and fifty pair, in place of two fifty pair.

Q. Then, in your estimate of the ultimate capacity, have you considered that fact? A. I have taken, in my estimate of ultimate capacity, the point of entrance into this ex-
2019 change, where we can bring fifty-six one hundred pair cables in through fifty-six ducts. It was designed to bring in fifty pair cables, but we can get one hundred pair cables in those ducts.

Q. In your estimate of the ultimate number of subscribers at 5,600, have you calculated the use of fifty pair cables at that point, or one hundred pair cables? A. I have calculated the use of one hundred pair cables, each cable to carry one hundred subscribers, there being fifty-six one hundred pair cables, which would fill up every duct entering this building, and would fill up every conductor in every cable with subscribers, a condition which is impracticable.

Q. A short distance from the exchange there are a great many more than fifty-six ducts, are there not? A. No, sir.

Q. Are there not more than fifty-six ducts in the entire system? A. There is one point only at which there are more than fifty-six ducts, but that would only carry fifty pair cable. It would not carry one hundred pair cable.

Q. Where is that point? A. From the front of this building to the corner of 14th and G, a distance of about seventy-six feet.

Q. How many ducts are there, then, which enter this building? A. Fifty-six.

Q. From your last testimony I gathered there were more than fifty-six. A. No, sir; not from me.

2020 Q. In your previous answer you state that at the point mentioned there are more than fifty-six ducts? A. But they do not enter this building, except fifty-six ducts, that come into the building.

Q. How near to the building do they come? A. They come in the center of the street, in front of the building.

Q. Then, to increase the number of ducts entering the building, it would be necessary only to excavate from the center of this building to the middle of the street in front of it. Am I right? A. You are right, if you limit the capacity to fifty pair cable. The seventy-six duct capacity I spoke of is planned to carry fifty pair cable, whereas the fifty-six ducts entering this building would carry one hundred pair cable. Therefore the fifty-six duct capacity is built to carry all the cables in one hundred pairs that the seventy-six duct capacity would carry in fifty pairs.

Q. Would the seventy-six duct portion of the work carry one hundred and fifty pair cables in each duct? A. No, sir.

Q. Would it in some ducts in which it now carries fifty pairs? A. There are none of the ducts that would carry one hundred and fifty pairs. It would take two ducts at least to carry one one hundred and fifty pair cable, and it would be doubtful whether it could get through that.

Q. How large are those ducts? A. Those ducts are
2021 two and three-quarters by eight inches. The entire system, with the exception of the entrance into the office, was planned to carry fifty pair cable, as that was the standard size of the cable at the time the conduit was constructed.

Q. When did the one hundred pair cable become the standard size? A. The one hundred pair cable became the standard size within the last four years. Now the standard is increasing, until, if I construct a conduit over again, I should construct it for one hundred and fifty pair cable, as I am doing in an exchange I am building in Baltimore at the present time.

Q. Have you not, within the last four years, constructed a considerable amount of conduit? A. Not within the heart of the city—not in the centrally located portion of the city.

Q. You have constructed some? A. I have not constructed any. I have reconstructed, in 1897, some of the old asphalt system. In doing so, the ducts would take either fifty, one hundred or one hundred and fifty pair cables, as it was found necessary to put them in.

Q. By a "reconstruction," you have heretofore explained, if I have understood your testimony, that you abandoned absolutely the old solid asphalt conduit, if it may be called such, and dug a new trench and laid in new terra cotta conduit. Is that right? A. Yes; right beside it.

Q. And yet you now state that, although in 1897 one hundred pair cable was the standard size, you used fifty
2022 pair cable? A. I did not say so.

Q. You constructed the conduit to take fifty pair cable? A. I did not say that. I said I constructed conduit that would take fifty, one hundred or one hundred and fifty pair cable, as it might be required. As a matter of fact, the large bulk of the cable in that new conduit, so reconstructed, is one hundred pair cable.

Q. When did you make your examination of the plant of the independent company in Richmond? A. It was at the time the testimony was taken by the complainants in this case.

Q. How long were you there on that occasion? A. I ar-

rived on one evening and left the next evening. I was there about twenty-four hours.

Q. You reached there after dark the first evening, did you not? A. Yes, sir; and I got out the next morning at half past four.

Q. What time was the taking of testimony commenced? A. The taking of testimony commenced a little after ten o'clock.

Q. Were you present when it commenced? A. A portion of the time.

Q. You were present practically during the taking of all the testimony, were you not? A. No, sir; a portion of the time I was present. I left before they adjourned for lunch, and got back some time after they resumed.

2023 Q. How many hours did you spend in investigating the plant? A. About seven hours.

Q. Between what hours in the day? A. Between half past four in the morning and ten o'clock or a little after ten, and from about half past eleven until, I think, about half past two, and from about half past five to seven. Of course this is as near as I can get at it. I did not take a note of the exact time.

Q. What proportion of the construction of that plant did you examine? A. I examined the portion within the central section of the city, in and around the exchange neighborhood, and also in the outlying district—what they considered out of the business section.

Q. Who was with you? A. I was by myself most of the time. I was with Mr. Gibson a part of the time.

Q. Who is Mr. Gibson? A. Mr. Gibson is an agent, I think, of the Southern Bell Telephone Company.

Q. Is he of Richmond? A. Of Richmond.

Q. Is the Southern Bell Telephone Company a licensee of the American Bell Telephone Company? A. I don't believe I am competent to answer that, except from hearsay.

Q. You understand that to be the case? A. I believe it to be the case.

Q. What part of the time was he with you? A. From
2024 eight o'clock on; during the time I was making the examination, from eight o'clock to a little after ten, and also in the middle of the day.

Q. Within the hours you have named as making the investigation did you take any meals? A. Yes, I guess I did; I took lunch and breakfast.

Q. You took those meals at the hotel or at some eating place, I suppose? A. Some eating place. I took one at the hotel and one at an eating place, unless you call the hotel an eating place also.

Q. How far out from the center of the city did you go in your

investigations? A. I don't know that I am familiar enough with the city to say how far I went from the center, or even where the center of the city exactly is, unless you call the Telephone Company's Exchange the center of the city.

Q. Take that. A. I should judge I was a mile and a quarter, roughly speaking, from that exchange.

By Mr. WORTHINGTON:

Q. In one direction? A. I was only a mile and a quarter in one direction. I don't think I went over half a mile in the other direction.

By Mr. BIRNEY:

Q. How much time did you spend in Norfolk in investigating the plant of the Southern States Telephone Company? A. I started out that morning about 5 o'clock. I was looking over the plant until ten. Then in the afternoon, from about
2025 half past two to about five. I took time for breakfast and lunch, but not dinner, within those hours.

Q. Was anyone with you upon that investigation? A. Part of the time.

Q. Who was it? A. Mr. Crews.

Q. Was he a telephone man? A. Yes, sir.

Q. What company? A. The Southern Bell Telephone Company, of Norfolk.

Q. What office does he hold? A. Manager, I think.

Q. What time did he join you? A. He joined me a little after eight o'clock.

Q. Do you know what proportion of the poles of the Southern States Company in Norfolk you actually observed on that occasion? A. I should think a little over half of them.

Q. How much time did you spend at Fort Wayne? A. I don't remember just how much time I was there. I got in there at ten minutes after four one afternoon.

Q. When? A. It was about the twentieth or the twenty-first day of last May. I forget the exact date. I got in there at towards ten o'clock in the afternoon on one day, and left, I think it was half past five on the next day, but I am not sure. It was somewhere between half past four and six.

Mr. WORTHINGTON: A. m. or p. m.?

A. P. m.

2026 By Mr. BIRNEY:

Q. Who went with you in your investigation of that plant? A. I went with several persons, and I went over a portion of it by myself. I was with Mr. Taylor.

Q. Who is Mr. Taylor? Is he the manager of the Bell Telephone Company of that town? A. I don't think there is a Bell Telephone Company in that town. It is the Central Union Telephone Company.

Q. Is he the manager of that company in that town? A. He is the manager of that company.

By Mr. WORTHINGTON:

Q. You mean he is the manager of the Fort Wayne exchange? A. Yes, sir.

Mr. WORTHINGTON: That company covers three States, you remember.

By Mr. BIRNEY:

Q. How much time did he spend with you? A. I should say he was with me about ten hours.

Q. How much time did you spend at Grand Rapids? A. I reached Grand Rapids at half past nine one evening and left there about half past five the next afternoon.

Q. I think you have already stated that Mr. Berry, the manager of the Michigan State Telephone Company, accompanied you in that inspection? A. A portion of it; yes, sir.

Q. Did you go to the office of the Citizens' Telephone Company? A. I went to the office, but not in the office.

Q. Did you make yourself known to the officers of the
2027 Citizens' Telephone Company? A. No, sir; I didn't think they cared especially to see me.

Q. Why? A. I don't suppose they had anything to say to me, as I didn't have to say to them.

Q. Why did you go to Mr. Berry, rather than to the Citizens' Telephone Company's officers? A. I had a letter of introduction to Mr. Berry.

Q. Referring to the photographs you have produced, do you find any substantial difference in the appearance of the streets as shown on those photographs, and the appearance of the streets in any city where the overhead system is in use? A. Yes, sir.

Q. What is the difference? A. There are in Grand Rapids and Detroit the heaviest loaded up pole lines I have ever seen in any of my travels. There are more heavily loaded lines than any pole lines I have ever seen.

Q. Are any telegraph lines shown on those pictures? A. No, sir; there are no telegraph wires.

Q. Mr. Crenshaw, have you ever had any experience in the use of spliced poles? A. I only had one occasion in Washington to attempt to use a spliced pole. That was in the alley in

the rear of Willard's Hotel. We attempted to splice a pole, thereby making it ninety feet in length, and found, when we got it up and spliced, that the pole was not strong enough to carry the wires it was intended to carry, and it was
2028 abandoned—taken down.

Q. Is that your only experience with spliced poles? A. That is my only experience with spliced poles.

Q. Then you never have used or tested in any way a spliced pole seventy feet high? A. No, sir.

Q. Have you learned the cost of spliced poles as compared with unspliced poles of the same length? A. No, sir; I have not.

Q. Have you not ascertained that the spliced pole costs as much or more than the unspliced pole? A. I testified that I thought it cost about the same.

Q. How have you gained your information about it? A. Simply from my experience and my knowledge of what poles cost and the labor of splicing two short poles together in place of one long pole. The wood itself would cost less. The labor I think, would make it cost as much, and possibly more. I have had no experience whatever except in this one case of the ninety-foot pole.

Q. Then your judgment as to the relative strength of the two kinds of pole is based on pure speculation, and not on experience? A. My general engineering knowledge of the strength of poles.

Q. Where and how have you gained knowledge as to the strength of spliced poles? A. I have gained no knowledge of the strength of a spliced pole over a pole not spliced. From an engineering point of view it cannot possibly be stronger,
2029 and therefore, unless it costs less, what is the object of splicing it, I cannot see. I would consider it very poor construction to splice a pole unless it would save a very large amount of money by doing so.

Q. Is it not a fact that spliced poles of the longer lengths, from sixty-five feet up to eighty, are used in a number of the large cities of the country? A. I do not know, except in these cases. There are possibly a few, but not as a regular thing.

Q. How many spliced poles did you see in Detroit, in use by the Detroit Telephone Company? A. I did not testify that they spliced the poles in Detroit.

Q. Where, then, did you see any spliced poles? A. In Grand Rapids.

Q. How many did you see? A. I did not count them, but I should say thirty or forty.

Q. Do you know how long they were? A. I should judge from sixty to seventy and possibly seventy-five feet in length.

Q. Are you sure there were so many as you have stated? A. I am sure there were approximately as many as I have stated.

Q. Did you find spliced poles used there by the Michigan Telephone Company? A. I did not.

Q. Did you examine their plant? A. I did.

2030 Q. You examined their plant also? A. I examined their plant, but not to the same extent I examined the Citizens' plant.

Q. To what extent did you examine the plant? A. I do not know exactly how to say to what extent. I suppose I saw eight or ten of their different pole lines.

Q. Of their different pole lines? A. Yes, sir.

Q. How many miles of their pole lines did you examine? A. I should say four or five miles.

Q. Did you ascertain whether they had any spliced poles? A. I did not, except from the examination. I did not see any.

Redirect examination.

By Mr. WORTHINGTON:

Q. Why, where there is no requirement, either by law or the Commissioners, as to the height of the poles outside of the city, do you use poles as high as thirty-five or forty feet? Why do you not use poles that are shorter and less expensive? A. Because in the thickly built up sections of the District it is necessary to clear obstructions, such as shade trees, fronts of houses, and so forth.

Q. Do you use shorter poles wherever no such reason applies? A. I do.

Q. In the District, outside of the city? A. I do, provided the number of wires to be carried does not make it necessary to use poles of the same height.

2031 Q. Since Mr. Birney has asked you whether you examined the plant of the Michigan Telephone Company, in Grand Rapids, I will ask you to state briefly what kind of a plant you found that company has.

Mr. BIRNEY: Objected to as incompetent, irrelevant and immaterial.

A. I found that company's plant in the central portion of the city to be in a very dilapidated condition. The outlying lines were in very much better shape.

Q. How did its outlying lines compare with overhead lines here in the District? A. Their recent construction, construc-

tion within the last three or four years, would be considered quite fair construction.

AUGUSTUS P. CRENSHAW,
By the Examiner by Consent.

Subscribed and sworn to before me this —— day of ——, 1899. ——— ———,
Examiner in Chancery.

The further taking of these depositions was thereupon adjourned until Wednesday, June 28th, 1899, at 8 o'clock p. m.

2032 WASHINGTON, D. C., July 7th, 1899, 8:30 o'clock P. M.

Met pursuant to agreement, at the office of the Chesapeake & Potomac Telephone Company, Washington, D. C.

Present on behalf of the complainants, Mr. BIRNEY and Mr. HEMPHILL.
Present on behalf of the defendant, Mr. WORTHINGTON and Mr. WILSON.

GUY BENNETT MAREAN, a witness of lawful age, called by and on behalf of the defendant in rebuttal, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. Where do you live, Mr. Marean? A. 1900 Lincoln Avenue, Washington, D. C.

Q. How are you employed at present? A. I am employed largely by the Interior Department to keep in repair their telephones. I have outside work which I do when that work does not keep me busy.

Q. How long have you been so employed by the Interior Department? A. I have been connected with it since the 1st of May, 1897. I have not been working all that time constantly. At first I did very little. Later I took more, and for about a year and a half or a year and nine months I have had almost exclusive charge. For over a year I have had exclusive charge.

2033 Q. What compensation, if any, do you receive from the Government for your services? A. I receive $40 a month.

Q. You said you have taken exclusive charge for a certain length of time. What is it you have charge of? A. The departmental telephones, the system constructed by the Western Telephone Construction Company, I believe it is.

Q. Of Chicago? A. Of Chicago; and owned by the Department.

Q. I wish you would just describe that plant in a general way; where the exchange is, how many switchboards there are, and so on. A. It consists of telephones somewhat similar to that one there (indicating desk telephone on the table in front of the witness). It is located in the Interior Department, having four switchboards, one in the Interior Department proper, ordinarily termed the Patent Office, another in the Atlantic Building, in the Indian Office, a third one in the Geological Survey, and a fourth one in the Pension Office.

Q. The Geological Survey is in the Hoce Building, near the Ebbitt House, I believe? A. Yes, sir.

Q. How are these different systems connected together, if at all? A. There is a single line connecting the central switchboard in the Interior Department building with each one of the other switchboards.

2034 Q. About how many telephones are comprised in this system? A. I believe there are one hundred and thirty-five.

Q. How many of them are in the Interior Department and how many of them in each of the other buildings, about? A. There are, I think, about ninety in the Interior Department.

Q. The rest are scattered in the other buildings? A. Yes, sir; about thirty in the Pension Building, about seven, I think, in the Geological Survey, and about five or six in the others. I cannot be positive of the exact number.

Q. In a general way, what are your duties with reference to this plant? A. I report twice a day to the operator and to the custodian at the Interior Department. They receive all complaints of the telephone being out of order and report them to me, and I repair them as soon as possible.

Q. Do you do that work in person, or do you have somebody else do it? A. In person.

Q. Where do you get the material necessary in making alterations or repairs? A. I ask the custodian to get it for me and he purchases it.

Q. It is furnished by the Government, and not by yourself? A. It is furnished by the Government.

2035 Q. You have been performing these duties with reference to that plant, you say, for a year and a half, entirely? A. Entirely.

Q. And you were connected with it before that? A. Yes, sir.

Q. In order that the plant may be further identified, if necessary, will you tell me whether you are acquainted with a man named Keelyn or a man named Duvall, in Chicago? A. I met a man named Duvall, I think it was, about a year and a half ago—I am not positive of the exact date—who repre-

sented the company. When he came here, he made a very careful examination of the system. He wanted to know the trouble, and I—

Q. You need not go into the details of the conversation with him. A. Yes; I am acquainted with him.

Q. It is the same plant with which Mr. Duvall was connected? A. Yes, sir.

Q. I wish you would tell us in your own way the efficiency of this plant, or anything that will enable the Court to determine whether it is a good one, or a poor one, or a medium one. A. I should say that, on the whole, it is a very poor one. The telephones get out of order very often. The whole construction seems to be poor, both cheap in material and very poorly installed.

2036 Q. I wish you would give us specifications of the defects, beginning at the principal switchboard and going out to the extremeties of the wires. A. The main trouble with the switchboard is with the plugs and the cords connected with them. They get out of order very easily, and break. Then the drops are difficult to repair, also. The levers have to be cleaned, and the way it is constructed, it is impossible to clean them without taking the thing apart.

Q. What levers do you mean? A. They have a system of levers which throw the operator in, ring, and throw the operator out again. The back of the switchboard, where the connections are made, is so arranged that in getting to them to repair a broken ringer coil, I believe they call them, of the drops, the wires very often break right where they are soldered on. The branch boards are equipped with a lightning arrester, which very often gets grounded. The cables leading from the switchboard to the boxes where the wires branch have given very little trouble. I have had but one trouble. At a place where there was a splice, two wires got caught once. The wiring of the boxes through the poles is very poor. They are separated from each other by rubber, two wires encased in cloth. They are fastened by staples which are driven in too deep, so as to cut the insulation and force the wires together; and the staples are put too close together, in a great many instances.

2037 Q. What harm does that do? A. Each one increases the trouble. There is liability of trouble at every staple, and each staple increases the trouble. The wire from the cable to the telephone is ended at some place in the room, either under the desk, or else in the ceiling. From that there is a cable which leads to the box. Those cables are cotton covered or silk covered. There is no rubber insulation. The cable goes into a metal box, and this box gives a great deal of

trouble. There is a fiber board, I suppose you would call it, upon which the binding posts are connected, nine of them; and this has sagged very often, and I have put paper in that in a great many instances, when the box itself was grounded. The bell and the hand generator which are in each box also very often get grounded. The cable leading from the box to the transmitter stand is poorer than the other one. The insulation on that is very thin; and in the box the cable is terminated in a series of tips, somewhat similar to this (indicating). I cannot describe them accurately. They get twisted off and will touch another binding pole, causing a short circuit. The binding posts are very poor construction and often work loose. The bells work loose also, and they will move either backward or forward, so the hammer will not strike.

Q. You mean the bell on the subscriber's instruments? A. Yes, sir. The cable—a six-wire cable it is—leading from the box to the transmitter is very poor, and the wires very often get short-circuited there and have to be replaced. The hook which is used, which has an automatic cut-off, gives
2038 me a great deal of trouble,

Q. Do you mean the hook upon which the receiver hangs? A. Yes. The construction is such that I have been unable to find any spring which would pull the hook up properly. I have used rubber bands for some time, and they are the most satisfactory of anything; but the best of all is the finger to hold them up.

Q. What do you mean by that, holding the hook up with the finger? A. Simply grasping the stem of the transmitter in the hand and pushing the hook right up with the thumb and holding while you are talking.

Q. Do you know whether or not the persons who use those telephones do that, as a rule? A. Some of them do and some do not. Those that do get more satisfaction than those that do not.

Q. Proceed. A. The contacts of the hook are very small, and get dirty very often, and I have to clean them. One telephone I think I have to clean on an average of once a month.

Q. Will you explain, so that those who are not familiar with the construction of the instrument will know what you are referring to when you say that the contact of the hook is poor. What do you mean? Just explain that. A. The transmitter has a connector for one side of the transmitter and also for one side of the talking line, and the hook is connected to that by resting on two screws, about which it pivots. Those screws get dirty, and the holes, through
2039 which they pass get dirty. The hook is pushed up, passing between two springs. One closes a circuit on

the transmitter, and the other closes the receiver circuit. Those springs are very small, and they get dirty, and the hook where they make contact gets dirty.

Q. What is the effect of that when one is talking through the instrument? A. It produces a noise sometimes so loud as to make the voice indistinguishable.

Q. Proceed. A. The transmitter gives a great deal of trouble by the carbon packing in it. I often have to take them apart and loosen that up with a screw-driver or penknife or something of that kind, and then screw it together again.

Q. What is the effect on the use of the instrument when the carbon gets packed in the transmitter? A. It produces a very muffled tone. It sounds as though the person was standing too far off, in talking.

Q. Have you finished? A. I think I have given all the causes of trouble.

Q. Take the plant as a whole; what would you say as to its value or efficiency. Give us now in general terms your conclusion as to that. A. I would say it is about as poor as I ever saw.

Q. Are you employed, in the performance of your duties, to make any report as to trouble of this kond? A. No; I have to make no report nor keep any account.

Q. Do you know whether or not any report is made by anybody else? A. Not that I am aware of.

2040 Q. In the performance of your duties, do you come in contact with the persons who use the telephones in these different offices? A. A great deal.

Q. While they are using them? A. While they are using them.

Q. And from that source, what can you tell us as to the judgment of those who use these telephones generally about them? A. There is general dissatisfaction.

Q. Now I will come back to Mr. Duvall's visit, and ask you to tell us a little more about that and what happened when he was here. A. Mr. Duvall came here some time ago and wished to know what was the trouble with the telephones. I got Mr. Wisedraugh, who is an engineer in the Interior Department, and who is very well acquainted with the telephone system. He saw the installation of it and had charge of it first of anyone; and together we took Mr. Duvall to all the switchboards and to several of the telephones and explained to him the trouble which we had with it.

Q. What was the result? A. Mr. Duvall admitted that the telephone—

Mr. BIRNEY: Objected to as incompetent and irrelevant.

A. (Continuing) —was at present very poor. He said we had old instruments and that the instruments made at present were much superior. That was about all he said to
2041 me.

Q. Did he do anything to make that plant better than it was? A. He didn't do a thing that I was aware of.

Q. How would you be informed that there was a trouble to be remedied in the service? A. I report twice a day to the operator in the Patent Office building and to the custodian of the Interior Department, and they report any troubles.

Q. Do you know how they receive their information? A. The custodian has the troubles reported to him. Sometimes the operator has trouble reported to her. Sometimes she notices them herself. Very often she notices them.

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Marean, when did you begin your connection with the Interior Department plant? A. The 1st of May, 1897.

Q. What had been your exeprience before that time in telephone plants, if any? A. I had none before.

Q. What is your age? A. I am not quite twenty-one.

Q. What electrical education have you had? A. I received a degree of Bachelor of Science at Columbian University on the 31st of May, I think it was, of this year.

Q. 1899? A. 1899; but I have read several maga-
2042 zines.

Q. How long was your course in electrical engineering at Columbia University? A. Four years.

Q. How long had you been studying in that course, if at all, before entering upon the service of caring for this plant? A. Two years all except one month, in May. The school ends the 1st of June and I entered in 1895.

Q. Do you regard yourself as an electrical expert? A. Do I, or did I?

Q. At that time. A. No; I did not.

Q. Do you regard yourself now as an electrical expert? A. I wouldn't say so.

Q. Had you been connected with any telephone company in any capacity before taking charge of this plant? A. No.

Q. Have you been connected with any telephone company since that time? A. No, sir.

Q. Have you cared for any other telephone plant? A. No, sir.

Q. When was that plant installed? A. I couldn't say positively. I think it was five or six years ago.

Q. You were not there then at the time of the installation? A. I was not there.

2043 Q. Do you know who constructed the plant? A. I have heard, I think.

Q. Of your own knowledge? A. I could not say positively of my personal knowledge.

Q. Have any new telephone instruments been substituted in that plant for old ones since you went there? A. In the Pension Office there have been three or four telephones of Swedish pattern put in, and as far as they go, they work very satisfactorily; but there were not enough of them. There was simply a transmitter and receiver put in. The other parts were the same.

Q. Except for the introduction of these few Swedish telephones, you know of no new telephones, or none that have been put in in substitution of those put in when the plant was originally constructed. Am I right? A. A short time ago a man named Henning, I think it was, a representative of this company, came on, and I believe he put in two new telephones up to date.

Q. Where were they put in? A. One was put in in the office of the chief clerk of the Interior Department and the other was put in some place in the Pension Office, I am not positive where.

Q. When was that? A. It must have been nearly a year ago.

Q. Can you fix the time any better than that? A. I couldn't state positively. I don't remember it exactly.

2044 Q. How do you know where that man came from? A. He stated that he came from those people, and he got the telephones and put them in there free of charge, which was good proof that he was from them, as an outsider would not be liable to give us telephones in the name of that company.

Q. How do you know they were given in the name of the company? A. They have the company's name upon them and there was no cost, as far as I could learn, attached to them. He came and installed them.

Q. Have you seen them both? A. I have seen one and I think I have seen the other, but I wouldn't state positively.

Q. Yet you do not know where the other one is? A. I don't remember.

Q. Do you know the names of the Swedish telephones that were put in? A. I couldn't give the name of them.

Q. Are they the Ericson patent? A. I think they are.

Q. They give good service, do they not? A. As far as they go.

Q. In what way did you learn the construction of telephone instruments? A. Largely by examining them.

Q. Do you mean by examining the instruments in th's system? A. Yes; and others. I have also learned by reading, and up there at the University we took a course to learn the construction. I learned by examining these.

2045

Q. What other types of instruments than those furnished by the Western Telephone Construction Company have you examined? A. I have examined this Swedish telephone. I have examined the Blake transmitter, the Harrison, I believe it is called, and I examined some time ago the automatic type, I think they called it—the one in which they dispense with the service of operators; and I have examined another telephone which has a seven balls contact in place of the granulated carbon. I don't know the name of that. I have also seen a telephone having one ball, but I never saw it in operation, and never examined it very closely.

Q. Have you ever been in a factory where telephones are constructed? A. Never.

Q. What opportunities for testing telephones than those in the Interior Department plant have you had? A. Practically none, except as I used them outside; that is, talking through other telephones when I wished to use them.

Q. How are you carried on the Government rolls? A. I doubt if my name appears on the rolls. There is an order written in the nature of a contract, under which I repair the telephones at a rate of $40 month. I have to execute vouchers and hand them in. They are approved, and I go to the disbursing clerk and he pays me my money.

2046

Q. Has your compensation been uniform from the time you were first engaged? A. Not mine. When it was first taken, it was taken by my brother, and he turned it over to me; but the compensation he received was what I now receive.

Q. When did he turn it over to you? A. I couldn't state positively. It was about a year and a half or a year and nine months ago. It was executed in my name the 1st of July 1898.

Q. Prior to that, he was the employe of the Department and executed the vouchers? A. Yes, sir; he executed them.

Q. And the pay was received in his name? A. Yes, sir; received in his name. I drew the pay for it.

Q. You did the work for him as his substitute? A. Yes, sir.

Q. Are you engaged in any other work? A. I have been recently.

Q. Of what kind? A. Electrical work, and collecting for the firm known as the National Electric Supply Company.

Q. How long have you been so employed? A. About a month, and I was employed by them some time ago for a month or two, possibly three months; I don't know how long.

Q. Is that the only outside employment you have
2047 had? A. While I had work.

Q. How much time did you give to your studies at the University? A. I gave on an average two hours a day and four or five hours every Sunday. Sometimes I gave a great deal more.

Q. At what time in the day did you attend the University? A. From 6 o'clock until 10 in the evening.

Q. Was the condition of the plant in 1897, when you first made repairs, as good as it is now, or not? A. I think not.

Q. You think it has improved since then? A. I think so.

Q. In what way has it improved? A. The one great trouble I found at first was the transmitter. The diaphragm was put on and the top was screwed down until the screws which held it in place were symmetrical across the transmitter. I found that in a great many of those the dirt had gotten in between the diaphragm and the top, which is necessary to make a contact. I cleaned that out and screwed them down, so that the screw would be in any position. A great deal of the cable was poor, and I replaced it; and a good deal of the wiring I replaced. I couldn't say how much.

Q. What you found was that the instruments were dirty? A. Yes, sir.

Q. That is, they had not been properly cleaned before? A. Yes, sir.

2048 Q. And you have kept them clean since? A. Yes, sir.

Q. You have spoken of the effect of putting a staple over two wires, so that the insulating material in the cover was cut through. To what extent, in your opinion, is that condition of the wires chargeable with the bad operation of the line? A. I think that in itself was sufficient to spoil the best system ever made.

Q. How much time have you given daily to that system? A. At first I gave five or six hours, and gradually decreased. In the last month it was down to about an hour.

By Mr. WORTHINGTON:

Q. An hour a day, do you mean? A. Yes.

By Mr. BIRNEY:

Q. Do you know who attended to that system prior to your going there? A. I believe a man by the name of Hullfish.

Q. Mr. Marean, when the carbon in the transmitter gets packed in the way you have described, what do you do to remedy it? A. I take off the top of the transmitter, remove the diaphragm and loosen it up with a screw-driver or pen-knife.

Q. Do you know whether that is necessary to be done with

every telephone transmitter in which loose carbon is used? A. No, sir; I do not. Do you mean every make?

2049 Q. Yes. A. That Swedish telephone I have had no trouble with. I never had to do that.

Q. You have had no trouble at all with that? A. No.

Q. That is a good talking machine, is it? A. Yes, sir.

Q. Did you find any broken telephones when you took charge of the plant? A. I remember that some mouth-pieces and quite a number of receivers were broken. That is all that gets broken, except the connection occasionally gets broken.

Q. Were those broken instruments in use? A. Yes, sir.

Q. Was any effort made to obtain any other instruments to replace them? A. As far as I could, I replaced them all. Whenever I encountered them, I reported them and tried to replace them.

Q. How many sets have you replaced? A. I don't know. A number of them would get broken several times. They drop them and break them.

Q. That is, the employes of the Department drop them? A. Yes.

Q. And break them? A. Yes.

Q. Do you know how many you found broken at the time you took charge? A. No; I couldn't say, because they

2050 would not be reported. There may be some now broken which have not been replaced.

Q. Have you inspected all those telephones at any time since you took charge? A. No, sir.

Q. How many of them have you inspected? A. I never inspect a telephone unless it is reported out of order.

Q. Then you have made no systematic inspection? A. No.

Q. And there are, as you suppose, a large number of those telephones which you have never seen? A. No; there must be a very small number.

Q. How many? A. I doubt if there are any, but possibly there are one or two that I have never seen.

Q. But you have at no time made a systematic inspection? A. At no time.

Q. Have you kept any record to show which telephones you have inspected, and when you inspected them? A. No; the operator has a very good record and I thought it was not necessary to maintain two.

Q. What kind of a record has the operator? A. She has a small book in which she writes, in lead pencil, every trouble which occurs. When I fix it, she asks me what it is and writes that down, and the date when it is repaired.

2051 Q. The operator makes no inspection, however? A. No.

Q. To how many persons are these telephones open to use; do you know? A. Every one in the Interior Department, I believe.

Q. Do you know how many persons there are employed in the Interior Department? A. I couldn't say.

Q. Several thousand? A. I think I have heard some place there are seventeen hundred, but I would not like to make a statement at all.

Q. What inspection, if any, have you made of the lines of wire of this plant? A. When I have had to replace them, I have worked where the wires are. They run parallel, and I have noticed them quite carefully.

Q. When you have had to replace what? A. Replace wires—replace lines.

Q. How frequently have you had to replace wires? A. I couldn't say; probably about fifteen or twenty lines, I think I have replaced.

Q. What do you mean by a line, in that connection? A. From the cable box to the telephone.

Q. The cable box is inside the building, is it not? A. There are several boxes.

Q. But any one cable box is within the particular building in which the switchboard happens to be? A. All the cable boxes are in the Interior Department—the main build-
2052 ing.

Q. Then the only wires you have replaced are fifteen or twenty leading from the cable box to the instruments? A. Yes.

Q. What is the outside construction? A. It is two copper wires from the central office in the main building to each switchboard; and a power wire for ringing the bell.

Q. When did you last inspect those? A. The last time I examined those was, I believe, about three months ago. I had a line down on a roof, and I repaired that.

Q. How are those wires carried? A. On the housetops.

Q. And before your examination of three months ago, when had you last examined these lines? A. I couldn't state. I could find that from the operator's notebook on the subject. Whenever there is any trouble I examine it.

Q. You have no regular time for going over those wires? A. No regular time.

Q. When you replaced the wire three months ago, how much of all the wires did you examine? A. I examined the line which leads from the Interior Department to the Geological Survey.

Q. Over its whole length? A. Over its whole length.

Q. When did you examine the line of wire from the Inte-

rior Department to the Pension Office? A. I couldn't
2053 remember.

Q. When did you examine the line from the Interior Department to the Atlantic Building? A. Some time ago—I think it was fully a year.

Q. Did you replace the whole wire between the Interior Department and the Hooe Building or Geological Survey? A. No; I replaced none of them. The line was down. The insulators had pulled off the roof and I had a different style of insulator bracket made and changed the position of it in such a way that I removed a few feet of wire.

Q. And that was all you did? A. Yes.

Q. Is that one of the lines of wires over which the staple is placed, according to your description? A. The staple is the inside wiring. This is outside wiring.

Q. Have you changed that staple arrangement at any time? A. Yes, sir; all the wiring that I have replaced has been of a different character. The wire was two thicknesses of wire, each wire separately insulated with rubber and cloth, and then twisted; and in some instances I used a leather strap with a single pointed tack driven through the staple to hold up the wire, and in others I used a tack which I put over one strand of the wire.

Q. Was that a difficult operation? A. It is a little more tedious than driving the staple, but there is nothing difficult about it.

2054 Q. How much time would it take to separate those wires in the entire system and fasten each down by itself? A. Do you mean the wires as they are?

Q. Yes. A. It would take a great deal of time, because the wires are fastened insulated, and wrapped in one covering and the covering would have to be cut to tack them separately.

Q. Do you regard your device of the strap as better than the staple? A. The strap is much better than the staple that was put in there originally.

Q. How long would it take to withdraw those staples and strap down the wires just as they are now, in their present covering? A. I couldn't say exactly; I never tried timing it. If there were several men put there, they could do it much more rapidly than I did. I worked alone.

Q. How long would it take you? A. To do the entire work?

Q. To do the entire work, working alone? A. I should say fully a month, steady, but I wouldn't be positive. I never timed it.

Q. The only material you would need for that would be the straps and the tacks? A. Yes, sir.

Q. Do you know how much has been spent by the Interior

Department in the purchase of material for repairs? A. I know nothing of that.

2055 Q. What material have you suggested for purchase in the last year, for use in repairing that line? A. In the last year I have asked for receiver boards, for mouthpieces, for receiver caps, for several parts of the transmitter, for cable, for wire, and I believe I ordered some plug cords, this year. I am not positive.

Q. What number or quantity, if you can remember, of each of these articles did you request to be purchased?

Mr. WORTHINGTON: Do you mean in the year?

Mr. BIRNEY: Yes.

A. I don't remember.

Q. Were they furnished you? A. Most everything was.

Q. Some of them were not? A. I ordered some hand generator coils some time ago, and they declined to get those. I ordered some receiver cords a long time ago, and for some reason there has been a long delay in getting them. I haven't gotten them yet.

Q. How long ago was it you ordered those? A. The receiver cords?

Q. Yes. A. It was in November, I believe.

Q. 1898? A. Yes.

Q. And you have not had them yet? A. I haven't had them yet.

Q. Before that time had you had any trouble in getting necessary supplies for repair purposes? A. Sometimes

2056 there was a very great delay, but I always got them before that.

Q. By "very great delay" what do you mean? Approximate the time. A. Sometimes three months, sometimes four.

Q. You were connected, as you have said, with an electrical supply house? A. Yes, sir.

Q. Do you know the cost or market prices of these various articles? A. No, sir. The supplies furnished me were almost entirely of a cheaper grade than that handled by the firm with which I have been associated.

Q. That is, they were cheaper and inferior in construction? A. Inferior.

Q. Do you know where they were obtained? A. Mostly from DuPerow on 15th street.

Q. Was that the rule with all these supplies? A. Almost universally.

Redirect examination.

By Mr. WORTHINGTON:

Q. You have stated there were a certain number of persons in the Interior Department who had the use of these tele-

phones. Do you know whether or not they used them generally? A. Some of them used them a great deal. Some of them used them as little as possible; and I know of one instance of one man refusing to use them.

2057 Q. Why was it that some persons used them so little and some not at all.

Mr. BIRNEY: I do not think he can tell that. It is objected to as involving hearsay.

A. Sometimes it would depend upon the telephones. At other times it would depend upon the person using them.

Q. Take the Geological Survey, for instance. To what extent are those telephones used there? A. Less, I believe, than any other in the Department.

Q. Do you know from conversations with persons there at the time they were using them, and the time you were working on them, anything about their reasons for not using them? A. They expressed universal dissatisfaction. They had no faith in them.

Mr. BIRNEY: We object to that as incompetent.

By Mr. WORTHINGTON:

Q. Have you had any opportunity to observe the working of any other telephone plant? A. No.

Q. Is there any other telephone exchange in the Interior Department except the one you have been describing? A. There is one belonging to the Bell Telephone Company.

Q. Where is that located? A. It is located in the same room and on the same table as the main switchboard of the Interior Department telephone.

2058 Q. How many telephones are connected with that exchange in round numbers? A. I think there are twenty-five or thirty.

Q. What have you observed, if anything, as to how that works? A. It seems, as far as I could observe, to work very satisfactorily.

Q. What have you been able to observe about it? A. Merely what I have heard. The operator generally tells me when there is any trouble with that.

Q. You have nothing to do with repairs to that plant? A. I have nothing whatever to do with that.

Q. Why is it, if you can tell us, that the usefulness of that plant you have been describing has improved since you went there? A. I suppose it was not properly taken care of before.

Q. And giving it proper care has improved it? A. Yes, sir.

Q Take it with the improvements you have put upon it; what would you say as to its efficiency?

Mr. BIRNEY: Objected to as having been already gone over.

A. Very poor.

GUY BENNETT MAREAN,
By the Examiner by Consent.

Subscribed and sworn to before me this —— day of——, 1899.

Examiner in Chancery.

2059 J. E. CRANDALL, a witness heretofore called on behalf of the defendant, was recalled in rebuttal, and examined.

By Mr. WORTHINGTON:

Q. Mr. Crandall, Mr. Duvall has testified in this case, on page 286, in substance, that the cost of maintenance in the telephone plant in Richmond to which he was referring was one dollar per telephone per subscriber's station. Can you give us any information that will enable us to judge of the accuracy of that estimate? A. Yes, sir. To get at the question in a way to make it explanatory, the service there is supposed to be metallic circuit service. Those instruments would require certainly two cells of battery to work the transmitters successfully. My experience, which is large, teaches me that we certainly cannot get along with less than three changes of battery per annum per telephone, in an instrument that is used very little; and the cost of battery alone, putting it at his figures, at a dollar, would not pay one-fourth of the cost of the battery.

Q. The battery alone? A. The battery alone, to say nothing about the changing.

Q. Do you know anything about the telephone plant that has been in operation for several years in the Interior Department, which was acquired from the Western Telephone Construction Company, of which Mr. Keelyn is president? A. Yes, sir; in a general way I do.

Q. Tell us what you know about it, of your own personal knowledge? A. As we have a system of our own in
2060 there, and as it is my business at the Interior Department to look after our system, I have been requested by a number of different persons there to try the department service for them and to tell them why it worked so poorly. I have been asked by the Chief Clerk of the Interior Department on several occasions, as to why the service there, for such a small length of line and such a small service, worked as badly as it did work. I have tested the instruments right at the station where I happened to be, and in calling other persons

found that the instruments worked very poorly. They seemed to be badly adjusted, badly constructed. There was a good deal of cross-talk; and in several instances I have looked into the instruments and been surprised at times that they worked as well as they did, from their method of construction, their form of construction. I never have made any very careful test of the instruments by measurements, but have made the usual telephone tests to determine leakages between conductors, and the efficiency of transmission by the method of talking and listening to the receiver. I suppose I have talked over ten or a dozen of the telephones in the office there. I have heard a great number of complaints about the inefficiency of the service; and those that I have tested I have found very inefficient.

Q. You say you have examined some of the instruments and were surprised that they worked as well as they did. What was the trouble with them? A. They were poorly constructed, principally.

Q. But in detail? A. The material used for contact was poor. The springs were weak in many instances. In
2061 fact, they are completely without platinum contacts, which is a very necessary thing where battery circuit has to pass. The adjustment of the automatic hook was poor. It is badly placed on the instrument. It is supposed to be an automatic hook which makes a contact by pressure. The pressure is very weak. The resistence is very strong, resulting in a very inefficient flow of battery current. The batteries are of a poor class, badly constructed. In fact, the instrument generally is, in comparison to the instruments I handle, a very poorly constructed instrument.

Q. Do you know anything of your personal knowledge of the rest of the plant, aside from the instruments themselves? A. I have looked through the switchboard very carefully. A great deal of that is crude work. The method of spring jacks and of line signalling is poor. It is uncertain. The contacts are mostly gotten by very light pressure. The plugs are badly constructed. They do not make positive contacts.

Q. What is the result of the use of the telephone where contact is light? A. In many cases almost ninety-five per cent of the efficiency is lost to the talker because of the light contact, which results from weakness of the spring.

Q. We will now return to the matter of the cost of maintenance. Have you made any calculation as to the cost of any other item of maintenance? A. Yes, sir; I have gone pretty well through the cost of our maintenance per telephone.

Mr. BIRNEY: This is objected to as not being in re-
2062 buttal.

Mr. WORTHINGTON: I am asking this with reference to Mr. Duvall's estimate of one dollar for maintenance in Richmond.

The WITNESS: Yes, sir; that is what I supposed.

Mr. BIRNEY: That is objected to, since Mr. Duvall's testimony in that regard was confined to the cost of maintenance, exclusive of operating expenses, and all other items than care of the subscriber's station.

Mr. WORTHINGTON: That is exactly what I am asking about, with reference to the care.

A. I am not including operating expenses, but simply the material and time that go to make up the maintenance of the subscriber's outfit, which includes the battery, the inspector's time, the cleaning of the instrument, the adjustment, the labor that is employed in seeing to that inspection. None of the office time—none of my own time or that of my staff—is included in that inspection at all. That is not a part of it. The cheapest inspection I can figure out per telephone is between ten dollars and twelve dollars.

Q. Per what? A. Per subscriber's telephone per annum.

Q. Mr. Dunbar has testified, among other things, that he was qualified to testify as an expert about the construction and operation of a telephone exchange because of a certain experience he had had with long distance switchboards and construction. Do you know anything about the system that was in use by the American Telephone and Telegraph Company for telephone service during the years when Mr. Dunbar says he was connected with it? You have read his testimony?

A. Yes, sir; very carefully. Prior to Mr. Dunbar's
2063 leaving the American Telephone and Telegraph Company, I know of no installation they ever made. In fact, the American Telephone and Telegraph Company never had anything to do with the local exchanges further than to specify their method of connecting their long lines with the local company's equipment and apparatus. The particular installation mentioned by Mr. Dunbar at Buffalo was, to my knowledge, planned by Mr. T. A. Pickernell. I know just at that time, during Mr. Pickernell's illness, Mr. Dunbar saw to the carrying out of those specifications; but it was only in connection with the Long Distance Company's service. The work they were doing in Buffalo was the same work that was suggested in Baltimore and Washington—having a board isloated from the local company's system and connected therewith by trunks having their own toll operators, using the local company's operator as a toll operator for the purpose of connecting the call for subscriber with the long distance service. The

first connection they had with a local company of any size was with this company, and that was several years after Mr. Dunbar's connection with the company ceased. So I know of no local experience Mr. Dunbar ever had.

Q. I would like to ask you further what the value of such experience as you say Mr. Dunbar had would be in qualifying one to judge of the cost of constructing and operating a telephone exchange such as this of the Chesapeake and Potomac Telephone Company in Washington? A. I cannot see that it would be of the slightest value, for the reason that the long distance company's work is entirely different. Their
2064 apparatus is different. Their method of maintenance is different. They have a very small number of subscribers connected in cities, and a very small amount of apparatus to operate and maintain; so that I cannot see how it is possible for Mr. Dunbar to have gotten any idea as to the cost of maintaining an exchange of a thousand subscribers—either the cost of constructing it or of maintaining it.

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Crandall, how was it you became familiar with the work done by Mr. Pickernell and Mr. Dunbar at Buffalo? A. I was in Buffalo during the time of the planning of the work, and in New York an average of once in two months, with the Long Distance Company; for the reason that we had practically the same problems in Baltimore that were being worked out in Buffalo.

Q. Were you then in the employ of the Chesapeake and Potomac Company? A. Yes, sir.

Q. Were you connected in any way with the Long Distance Company? A. No, sir.

Q. Were you associated with Mr. Pickernell? A. Only in the way of consulting as to the long distance connection with our local service.

Q. That is, you were consulting him about the long distance connection in Baltimore? A. In Baltimore; and visit-
2065 ing the various cities to see what various plans were being made there.

Q. How much time did you spend in Buffalo? A. I was there four days.

Q. Four consecutive days? A. Four consecutive days.

Q. Was Mr. Dunbar there at that time? A. Yes, sir.

Q. Was Mr. Pickernell there? A. Mr. Pickernell was there one day of the time.

Q. How much time did you spend in New York? A. During the years from 1888 to 1891 I was in New York very fre-

quently, and always in connection with one of the three places, either the Western Electric, the Long Distance, or the Metropolitan Company.

Q. To go back for a moment, at the time you were in Buffalo, how far had the work of installing the system spoken of by Mr. Dunbar progressed? A. The cabling was practically all in. The system was in operation, and a good deal of the detail had not yet been finished.

Q. Where did you see the plans of this system at all? A. In both places; in the Buffalo office, in the office of Dr. Culbertson, their superintendent, and in the Long Distance Company's office in New York.

Q. Did those plans involve excavating for conduits? A. The plans that I went through did not, Mr. Birney. The plans that I went through were of the electrical construction purely. I incidentally looked at the other plans.

2066 Q. What do you mean by the electrical construction, as distinguished from the remainder of the plant? A. That is the switchboard and all the electrical apparatus, the switchboard and the subscriber's equipment, That is my work, purely.

Q. Then you confined your investigations to that part of the plant? A Yes, sir.

Q. Because that fell within your line of work? A. Yes, sir.

Q. You knew Mr. Dunbar and Mr. Pickernell were associated? A. Oh, yes, sir; Mr. Dunbar was Mr. Pickernell's subordinate.

Q. What was Mr. Pickernell's position? A. Engineer of the American Telephone and Telegraph Company.

Q. Chief engineer? A. Electrical engineer.

Q. And Mr. Dunbar was his assistant? A. His assistant. He is an engineer.

Q. You were not present at any time when the plans were under discussion by Mr. Dunbar and Mr. Pickernell, were you? A. Not while they were in conference, that I remember, but I discussed the plans with both of them, individually and in a collective way.

Q. Did you know they conferred together about them. A. Oh, yes.

Q. Mr. Crandall, how often have you visited the Interior Department in the last two or three years? A. I am there
2067 a great deal, Mr. Birney. I suppose the average would be once a month. Possibly not so great.

Q. When did you install the telephones of your company now in use there? I think you said there were about twenty-five. A. I think there are between eighteen and twenty-two —that is, of old installation. We are constantly putting in

or taking out there. They have had three different installations there. The board they have now was installed by us in 1888 or 1889—possibly 1887. The present board we made specially for them.

Q. What type of instruments are used? A. They are principally Blake instruments.

Q. What proportion or what number of them are Blake instruments? A. They are all Blake instruments except two.

Q. The other two are what? A. Solid back, long distance instruments.

Q. In what rooms are those two instruments? A. The Chief Clerk is connected with that board by metallic circuit, and the Secretary's office has a metallic circuit.

Q. What is it that takes you there so often as once a month? A. There are various things—looking after our service, canvassing for other service. We have no complaints about our service. It is principally canvassing service.

Q. How often do you inspect your instruments at the Interior Department? A. The average is about sixty-five
2068 days. We vary from forty to sixty-five days for our periodical inspections.

By Mr. WORTHINGTON:

Q. Do you mean of that plant or of the whole system? A. The whole system.

By Mr. BIRNEY:

Q. How far does that inspection go? What do you do? A. The inspector has full instructions. It is quite a long letter. The instructions are issued by me.

Q. I do not want to go into detail. A. His duty is first to go and examine the instrument physically and then see that it is clean. That is his first duty. Then he examines the battery to see that the jar is clean and that the battery has not overflowed. Then he makes an electrical test. The first is the physical examination and the next is the electrical test, with the test operator, located in this building, as to the efficiency of the service. If the instrument is soiled or dirty, he cleans it. He then makes a superficial examination. The efficiency of the instrument is determined not by the inspector but by the test operator.

Q. What effect has dirt in an instrument upon its efficiency? A. There are various effects. There is dirt that causes corrosion. That would represent high resistance to the passage of the current, and would have a serious effect upon its efficiency. There is a smutty dirt that comes from moisture collected by the more subtle form of dust. That is really a conductor, and

the current would spread out. It would not be clear. It would not be snappy. It would be broad, noisy.

2069 Q. Making the sound of the voice indistinct? A. Indistinct and sputtery, muttering, a muffled sound. Then there is a dirt in the shape of rust, which is an electrical conductor of high resistance. Dirt is an enemy to a telephone circuit—all classes of dirt.

Q. And for that reason you keep your instruments as clean as you can? A. Yes, sir.

Q. In making this inspection, the inspector takes the instrument all apart, does he not? A. Not unless it is necessary. His first duty is to take the cap off the receeiver to see that there is no dirt on the magnet, and to open the transmitter, if it is a Blake instrument, and see if the electrodes are properly adjusted. If it is a solid back instrument, he goes through two motions; first, to raise it up and look at the mouthpiece and see if it is clean; then to push it down to see if it moves properly. He then puts the receiver to his ear, and he moves the hook up and down to see that he gets a snappy, clear break.

Q. How long do the cords upon an instrument last? A. It varies a great deal. Many people are careless, and let the telephone hang while they look for information, causing a strain right on the tips. The cord is always affected right at the tips. Our average in business places for cords, I think, is about three months, and for residences, about five months, before they begin to unwind, or the worsted wears out, or the tips get defective.

Q. Does the charcoal in the instruments ever become packed? A. Not in our solid back instruments.

2070 Q. How about the Blake instrument? A. The carbon can't pack in the Blake instrument.

Q. In which of your instruments does the carbon pack? A. In none of ours—none of the style we use now.

Q. I understood you, in your testimony given at an earlier stage of the case, to speak of the packing of the carbon as one of the difficulties to be found in instruments? A. We had a form of transmitter where the carbon did pack.

Q. What did you call that? A. That was the Hunning type. It was practically a solid back instrument.

Q. When did you use that? A. We used a great many of those in the latter part of 1888, 1889, 1890 and 1891, possibly, We had a great deal of trouble with packing at that time.

Q. But you used a great many of them at that time? A. No; we hadn't many metallic circuits at that time. We had possibly ninety per cent. of all the metallic circuits equipped with that instrument at that time.

Q. And in those you had difficulty with the packing of the carbon? A. With packing; yes, sir.

Q. Did you have much difficulty? A. Oh, no; it was not a trouble that worried us a great deal. The principal trouble was in the subscriber getting his instrument out of shape, and leaving it that way—putting the pressure of the carbon down towards the diaphragm, and the teams passing at night,
2071 and things of that sort, did push the carbon down close together. If it was left level, or after he talked into it several times, the carbon would jar up and get in good shape.

Q. Is that one of the principal reasons for getting rid of the Hunning instrument? A. That is one of the reasons; but it is not as efficient an instrument as this present solid instrument.

Q. When did you begin to use the instrument now in use as the solid back instrument? A. I think in 1891. By 1893 we used them exclusively.

Redirect examination.

By Mr. WORTHINGTON:

Q. Since your cross-examination was concluded, have you, at my request, found a letter showing the instructions which you give to your inspectors under which they work in performing their duties? A. Yes, sir.

Q. What is the particular paper which you have produced? Give us the date. A. It is under date of August 6th, 1898, to Mr. H. T. Legg, inspector.

Q. Signed by whom? A. Signed by myself, James E. Crandall.

Q. Is that some special instruction that was given to that man at that time, or does it show substantially the instructions under which your inspectors work? A. It shows substantially the instructions under which the inspectors
2072 work.

Mr. WORTHINGTON: I offer that paper in evidence.

The said paper is filed herewith, marked "Exhibit Crandall Rebuttal, No. 1," and is in the words and figures following, *to wit:*

The Chesapeake and Potomac Telephone Co.,
No. 619 Fourteenth Street, N. W.
WASHINGTON, D. C., August 6th, 1898.

The Chesapeake and Potomac Telephone Company, Mr. H. C. Legge, Inspector, Washington, D. C.:

Dear Sir:—I have decided to start you on the work of inspection Monday, the 8th instant. Your route will be known as route No. 1; starting at 15th and New York Avenue, along

the south side of New York Avenue to 7th street, thence on the west side of 7th street to the river front; following the river front to 15th street; thence taking in both sides of 15th street back to the point of starting, 15th and New York Avenue. This route embraces about 650 subscribers.

You will be expected to make all battery repairs, except the entire changing of the battery; see to all changing of cords, bells, or instruments and bells, keeping the metal parts of the bells and instruments properly cleaned. Where Fuller battery is used, you will only be expected to change the zincs and add a little mercury, if necessary. You will be furnished with special report sheets, which are to be used where it is necessary to re-run office wire, re-make ground connections, or change bells, or entire battery, tighten backboards on
2073 the wall, or change backboard or entire set of instruments. These reports are to be turned in promptly to the Chief Inspector's Office, where they will receive attention. You will notice on your card, at the top, there is a place for the instruments, bells, style of service, protectors, etc. I desire to have the number and styles of instruments placed on your card by you, in order that we may be able to completely check up our instrument records. This is a matter that requires careful observation, and you will, therefore, make no mistakes in taking the number of the instruments. You will also notice that there is a place for the subscriber to sign on your card. If there are any objections on the part of the subscriber to signing the card, please make such report to me.

I prefer that you have no conversation with the subscribers outside of your legitimate work; that is to say, if any comments should be made about the company making these inspections, at this particular time, or what its purpose is in making them, I desire to have you say that you know nothing further than that the company has been making periodic inspections in parts of its territory for over a year, and has determined to apply it generally.

An Inspector's success depends largely upon knowing his own business well, and no part of the business that is in charge of other persons, remembering to be courteous and to furnish prompt answers at all times, when you are questioned on any matters pertaining to the Telephone Company.

I desire you to be particularly careful in the making of your special reports; when any trouble is noticed on your
2074 route, when you report, which I desire to have you do about every thirty minutes to the Test Operator, you will be sent to that point at once, leaving your regular work, to investigate the cause of your trouble. When such investigation is made and the trouble remedied, you will return to

the point on your route where you left. These special reports are subjected to careful scrutiny by me, and I desire to have just as full explanation as possible made thereon, the complaint, of course, will be made by the subscriber; and, in visiting his place, talk with him about his difficulty, and show or explain to him what caused the same; make such remarks as apply to the trouble on your report sheet, getting the subscriber to sign at the proper place on the sheet.

Yours very truly,

(Signed) J. M. CRANDALL,
Electrician and Superintendent of Equipment.

2075 Mr. BIRNEY: This paper is objected to as unnesessary.

By Mr. WORTHINGTON:

Q. Are you acquainted with any telephone transmitter in which carbon is used in which the carbon will not occasionally pack, except that which is known as the Bell Solid Back? A. No; I am not.

Recross-examination.

By Mr. BIRNEY:

Q. What study have you made of other types of telephones? A. I have tested pretty nearly all of them, Mr. Birney.

Q. To what extent have you tested the Ericcson telephone? A. I have been through it and tested it for my own satisfaction.

Q. What test did you give it? A. Simply an office test, not a laboratory test. I looked into it and tested it to see how it worked, simply a local test. I never tested any of them except in a local way, with what is called an office test. That is, I never subjected them to line tests.

Q. Does that instrument use the granulated carbon? A. Yes, sir.

Q. How do you know, if you do know, whether the carbon in that instrument will pack? A. I don't know that it will pack or that it will not pack.

Q. What other instruments manufactured by other companies than the Western Electric Company have you exam-
2076 ined than the Ericcson? A. I have examined the Keelyn. I have examined the Turnbull and the Manhattan and the Emmner—quite a number of them. I don't remember the names.

Q. Do those instruments you have named all use granulated carbon? A. No, sir; they use carbon in some form.

Q. Which of them use granulated carbon? A. The Keelyn transmitters use granulated carbon; the Ericcson instruments use granulated carbon. I really don't know which others. I

don't know that there are any others. Most of them use carbon in the solid form—sticks or buttons, one or the other.

Q. You do not know that there are not other firms using granulated carbon? A. No, sir; my test and examination was really more on the construction of the instrument than otherwise.

Q. Have you submitted any of the instruments you have named to any other examination than an office examination? A. No, sir; no line tests.

J. E. CRANDALL.
By the Examiner by Consent.

Subscribed and sworn to before me this —— day of ——, 1899. ——— ———,
Examiner in Chancery.

Mr. WORTHINGTON: Counsel for the defendant here offer in evidence the following extract from the District of Columbia appropriation bill, approved August 7, 1894:

2077 "And the Commissioners of the said District are hereby empowered to authorize the erection and use of telephone poles in the public alleys of the city of Washington; provided, however, that all telephone poles so erected shall be subject to use by the said District for the stringing of wires thereon, to be used for fire-alarm and police purposes, without any charge therefor to the said District; such privileges as may be granted hereunder to be revocable at the will of Congress without compensation."

Also the following extract from the District appropriation bill, approved March 3, 1897;

"And the authority granted to the said Commissioners in the District of Columbia appropriation act, approved August 7, 1894, to authorize the erection and use of telephone poles in the alleys of the city of Washington, shall be limited as follows: Hereafter no wires shall be strung on any alley pole at a height of less than fifty feet from the ground at the point of attachment to said pole."

The further taking of these depositions was thereupon adjourned until Saturday, July 8th, 1899, at 1:30 o'clock p. m.

2078 Washington, D. C., July 8th, 1899, 1:30 o'clock p. m.

Met pursuant to adjournment, when a recess was taken until 2 o'clock p. m.

Washington, D. C., July 8th, 1899, 2 o'clock p. m.

Met pursuant to adjournment. Present on behalf of the complainants, Mr. Birney and Mr. Hemphill.

Present on behalf of the defendant, Mr. Worthington.

UNION N. BETHEL, a witness of lawful age, called by and on behalf of the defendant in rebuttal, having been first duly sworn, is examined.

By Mr. WORTHINGTON:

Q. Mr. Bethel, will you state your full name? A. Union N. Bethel.

Q. Where do you reside? A. Upper Montclair, New Jersey.

Q. Your occupation? A. General manager of the New York Telephone Company.

Q. How long have you held that position? A. About five years.

Q. What territory does that company operate in? A. The boroughs of Manhattan and Bronx, New York City, and
2079 certain territory in New York State and Connecticut, lying within thirty-three miles of the New York City Hall.

Q. Were you connected with the company before you became general manager five years ago? A. No, sir.

Q. Were you connected with the telephone business? A. Yes; I was treasurer of the New York and New Jersey Telephone Company.

Q. The one with which Mr. Sargent is connected? A. Yes, sir.

Q. Have you seen an article headed "New York Telephone Company" in a German periodical called Elektrotechnische Zeitschrift, under date of January 6th, 1898? A. I have.

Q. I wish you would tell us whether or not that article emanated officially or by authority from your company? A. No, sir; it did not.

Q. Do you know in what way these alleged statistics came to the publishers of this paper? A. Yes, sir.

Q. How was it? A. One of the young men connected with our company made a trip to Europe on his own account and incidentally visited several telephone people. They gave him information in casual conversations about their conditions, and on his return he sent them the paper upon which this article is founded.

Q. Can you tell us whether or not the statistics are
2080 accurate? A. No, sir: I could not testify to their accuracy.

Q. You do not impugn them, but you cannot vouch for them? A. That is it exactly.

Q. In one of the tables contained in this article, table 3, there is given, first, the number of subscribers in several exchanges in New York, and then the number of calls per subscriber, from which it appears, among other things, that the number of subscribers in the Cortlandt Street Exchange was 4,860 and the calls per subscriber 11.7, while the number of subscribers in the Broad Street Exchange, for instance, was 1,855, and the number of calls per subscriber 13.7, indicating, in this particular comparison, the number of calls per subscriber as less in that exchange which had the more subscribers. Assuming these figures to be correct, is there anything in the situation with reference to those exchanges which would throw any light upon whether that result could be adopted as a rule applicable to telephone exchanges in general? A. No, sir; the exchanges are so connected that they work as one system; and the fact that the average calls per line were less in the larger or Cortlandt district than in the smaller or Broad street district, I would attribute, assuming the figures to be correct, to the difference in the character of business transacted in those districts. The Broad street district is essentially the commercial exchange district. The produce and stock exchanges and exchanges of that character are in that district. The Cort-
2081 landt district covers the wholesale dealers and a great many retail dealers. Their business requirements would probably lead them to use the telephone less frequently than the subscribers in the Broad street district.

Q. Can you tell us whether or not, from the manner in which your records were kept or your tests made, this statement, if accurate, would represent the number of calls from the exchanges mentioned to all the other exchanges included within the territory, or whether it would refer only to calls made, in the case of the Cortlandt Street Exchange, to subscribers whose wires led directly to the Cortlandt Street switchboard? A. It would represent the calls that originated in that district from all points covered by the system.

Q. Would that be so as to the other exchanges included in this table 3? A. Yes, sir.

Q. The number of calls given, whether the total number of calls or the calls per subscriber, are the calls to all the other exchanges than those to the one in question? A. Yes, sir.

Q. Would there then be any way of ascertaining whether the calls per subscriber increase as the number of subscribers increases than by taking the total number of calls all over the

city with a certain number of subscribers, say 10,000, and then comparing them with the total number of calls with an increased number of subscribers, say 20,000? A. That would seem to me to be the only fair way.

2082 Q. These tables purport to give certain statistics with reference to the business of your company in the years 1896 and 1897. Has there been an increase in the number of your subscribers since then? A. Yes, sir.

Q. Have your rates increased or decreased? A. Decreased.

Q. Why is it that as your subscribers have increased your charges per subscriber have decreased?

Mr. BIRNEY: Objected to on the ground that this was matter for testimony in chief and was fully inquired into, and it is not matter for rebuttal testimony.

Mr. WORTHINGTON: Counsel for defendant state on the record that they consider this testimony competent in rebuttal in view of the contents of the German publication referred to with reference to the New York exchanges, which was put in evidence by the complainants. A. The increase in the number of stations has been chiefly due to the reduction in rates. I can cover that point more fully than that, if you want it done.

Q. Yes; I want you to tell just what changes, if any, have been made in your system of charging, what the result has been, and if you have any statistics bearing upon this question I would like you to produce them.

Mr. BIRNEY: The objection is repeated.

A. I would simply say that until 1894 our rates were flat rates; that is, a flat sum per year for the telephone service, without regard to the number of messages sent. In 1894 we introduced a system of charging per message. Various

2083 modifications and reductions in rates under this system have been made since that time, and the number of stations has increased from 9,981 on January 1st, 1894, to 31,241 on June 1st, 1899. Nearly eighty-five per cent. of these stations are on the message rate basis.

Q. At present? A. At present.

Q. Have you, at my request, brought some tables here showing the manner in which your proportion of message service to flat rate subscribers has changed from time to time? A. Yes, sir; I have.

Q. Let me see them, please.

(The witness here hands to counsel for defendant the following papers):

Paper headed "Cause and Effect. Rates for telephone service and number of telephone stations in New York City, 1893-1899."

The said paper is offered in evidence by counsel for the defendant, and the same is herewith filed, marked Exhibit Bethel No. 1.

Mr. BIRNEY: Objected to as responding to nothing in the testimony for the complainants, and as incompetent, therefore, in rebuttal.

(Also paper headed "Disappearance of the Grounded Circuit System.")

The said paper is offered in evidence by counsel for the defendant, and the same is herewith filed, marked Exhibit Bethel No. 2.

2084 Mr. BIRNEY: Objected to as responding to nothing in the testimony for the complainants and as incompetent, therefore, in rebuttal.

(Also paper headed "Increase in Telephone Stations in New York before and after the adoption of message rates.")

Said paper is offered in evidence by counsel for the defendant, and the same is herewith filed, marked Exhibit Bethel No. 3.

Mr. BIRNEY: Objected to as responding to nothing in the testimony for the complainants and as incompetent, therefore, in rebuttal.

(Also paper headed "Progress of the New York Telephone System under Message Rates.")

The said paper is offered in evidence by counsel for the defendant, and is herewith filed, marked Exhibit Bethel No. 4.

Mr. BIRNEY: Objected to as responding to nothing in the testimony for the complainants and as incompetent, therefore, in rebuttal.

By Mr. WORTHINGTON:

Q. From your experience with New York exchanges will you tell us whether or not in your judgment if the flat rate system had been adhered to instead of changing, as shown by these papers, in a large proportion to the measured service, you would have been able to reduce the rates as you have done under this measured service system.

Mr. BIRNEY: The objection is repeated.

A. No; sir.

2085 Q. Why? A. The flat rate in New York, in a business place, was and is $240; at a residence, $180. By offering no other rates than these, we could have attracted only customers whose demands upon the service were heavy enough to justify them to pay that amount of money. The

growth, in my opinion, would have been very much restricted. By adopting a message rate system, we were able to offer very low rates to those making a small or moderate demand upon the service, and to this fact the growth has been chiefly due.

Q. Why did you not reduce your rate from $240 a year to say $50 a year, and by the greater number of subscribers make up what you would lose in rates?

Mr. BIRNEY: The objection is renewed.

A. With no restrictions upon the right of use in a large system, the traffic would grow with the potentiality of the system. The traffic per station would have been very heavy and the cost of furnishing service would probably have been greater in the large system per station than in the small system per station. When we had in round numbers 10,000 flat rate stations, if we had added 10,000 other flat rate stations, making the same demands upon the service, my opinion is that it would have cost us more per station when we were serving the 20,000 than when we were serving the 10,000. Therefore a reduction such as you suggest would have been disastrous, financially, to the company.

Q. Would it have made any difference in the result of which you have just spoken whether the subscribers all
2086 reached a single central station or whether they were divided up among a number of sub-exchanges? A. There might have been some difference, but I think it would not have been great enough to materially affect the ultimate result.

Q. Do I understand you to say that in either case you would have expected an increase per subscriber in the cost to the company? A. In either case.

Q. Have you read the paper filed in this case and marked Exhibit Elterich No. 1, purporting to be a translation of a part of the article in the German paper to which I have referred? A. Yes, sir.

Q. What would you say as to whether that translation is intelligible or conveys a correct idea of what it was intended to state? A. I have arrived at what I believe it to have been the intention to express, through great difficulty and only because I am familiar with telephone practices.

Q. Suppose that paper were read by somebody who is not an expert in telephone service and not acquainted with matters in New York; what would you say as to whether it would give him a correct idea? A. In my judgement, it would be almost impossible for one not familiar with the practices in New York to get any reliable information from this paper. For example, referring to one of the exhibits, he says that A indicates the cases in which the official "inserted him-

self and asked 'Are you done?'" He means that A indicates cases in which the operator connected her line with that of the subscriber and asked: "Are you through?"

Q. Are you familiar with the German language? A. No, sir.

Q. Mr. Bethel, without further illustration of the ambiguity of this alleged translation, I wish you would take the paper from the beginning, excluding the title, and read it according to what you understand it was the idea that was intended to be conveyed, so that a person who is not familiar with the business may comprehend what it is all about.

Mr. BIRNEY: Objected to on the ground that the witness' answer cannot even tend to show that the translation is not an accurate translation.

A. (Reading.) "The New York Telephone Company keeps very accurate statistics of the traffic in and between its several offices on the one hand for reasons of economy, and on the other hand, to achieve the most rapid and efficient service. We are in a position to make the following communication thereof.

"We next give, in Figure 11, a diagram of the increase of the number of subscribers in New York from January, 1895, to October, 1897. As we have, at an appropriate time reported, the telephone company in that place in the year 1894 introduced the message rate system along with the flat rate system. This diagram shows very clearly how the message rate system has contributed to the increase in the number of subscribers, which, in the course of the last three years,
2088 has almost doubled; for, while the number of flat rate subscribers is constantly decreasing, the number of message rate subscribers rises very rapidly. In the course of fifteen months, from October, 1895, to January, 1897, this number has doubled. One must, however, in judging these results, not leave out of consideration that the flat rate is $240 per year, about 1,000 marks, which amount would be considered excessive according to European ideas.

"There is a further remarkable fact shown in the diagram —the great number of public telephone stations; the latter aggregating, at the end of 1896, 1,827, or, roundly nine per cent. of all stations. It is further evident from the diagram that for one and a half years, the entire New York telephone system is on a metallic circuit basis. Indeed, with the exception of only one subscriber who pertinaciously is opposed to have his old grounded line changed into a metallic circuit, all the rest of the subscribers have either quietly submitted to the increase of their flat rate from $160 to $240, incidental to this change in the character of the service, or they have gone over to the message rate system.

"The annexed table, No. 1, shows the increase in traffic during the twelve months from September, 1896, to September, 1897. From the figures in this table we point out that the increase in subscribers amounts to 21.1 per cent., but in daily calls to 27 per cent.; so that an increase of 5.6 in daily calls per subscriber is the result. While, however, the increase of work to be done, that is, of calls, as before stated, amounted to 27 per cent., yet the number of operators has increased
2089 but 20.1 per cent., so that an excess of work of 6.4 per cent. per operator's position is the result, that, however, in spite of the greater amount of work done by the average operator, the traffic has a constant and rapid increase, is exhibited by the other tables, 2-4, which we in part reprint in extenso, although a greater portion of the figures is without essential interest to those who are not familiar with local conditions. Yet the tables, as a whole, have considerable interest because they show by particulars how carefully the traffic is watched, which is characteristic of the management.

"Next we give, in figure 12, the traffic curves of the six largest offices, according to the count made on October 11th, last year. Such counts take place on the 10th (occasionally the 11th) day of each month. These curves show how great the endeavor is to bring the number of operators in harmony with the volume of the traffic at the different hours of the day.

To the table presented, which shows the traffic curves, as shown by this monthly statement, a table is always added, containing a summarized statement regarding the volume of the traffic. The table for October 11th has been reproduced in table 3. As may be seen from the same, the number of subscribers per operator is pretty low, as compared with conditions in Europe.*

2090 This is explained by the fact that the operators, after making connections, must be convinced that the called for subscriber reports himself before considering her work finished, and also because of counting the messages necessary under a message rate system. Both facts, of course, lead to an essential increase in the work. In New York, it seems, the experience with the message rate system has not been the same as in Switzerland, namely, that the system largely reduces the number of calls, for the average number of 10.8

*Similar figures for the most efficient systems in Europe are:

In Stuttgart	100
Zurich	80
Basle	80
Brussels	120
Berne	120
Munich	150
Christiania	140

calls per day per subscriber is by no means particularly low, in view of American conditions."

From the words "striking is the great number of connection lines," on page 3, down to the words "with which connection line he shall connect the calling subscriber," on page 4, it refers to trunk lines between central offices, and is therefore omitted. From that on down to the end of the paper relates to test calls made by service inspectors showing the efficiency of the service, which I am glad to see he compliments very highly. I do not know that you want that.

Q. That I do not care for. I only want the part which you have explained. Have you here a card showing what the rates are in New York under the message or measured rate system? A. Yes, sir; this is it.

(Witness produces the card referred to.)

The said card is offered in evidence by counsel for defendant, and is herewith filed, marked Exhibit Bethel No. 5.

2091 Mr. BIRNEY: Objected to as not matter in rebuttal, and as incompetent.

By Mr. WORTHINGTON:

Q. Have you any personal knowledge as to European telephone service and rates? A. Yes, sir. Two years ago I made a personal visit to some of the European countries, and particularly looked into the telephone conditions in England, Norway, Sweden, Denmark. I also visited Germany, Switzerland and France, but in the three last named countries I did not make what I would consider a personal inquiry into telephone conditions there. During the last year, I have held conversations with representatives of the National Telephone Company of Great Britain, with the general manager of the general telephone company of Stockholm, with a representative from Paris, one from Japan and one from Australia who has visited New York; and in that way I am personally familiar with the conditions.

Q. Generally, have you endeavored to acquaint yourself with the telephone service and telephone rates of foreign countries? A. Yes, sir.

Q. What do you say, in a general way, as to whether the rates are higher or lower in those countries than in this country? A. They are lower in Europe than they are here. If we consider the conditions in the two countries, the purchasing power of money, the character of service, and all other
2092 conditions that should be properly taken into consideration, I should say that the rates in America were fairer than they are in Europe, with the exception that

where governments render the service and disregard commercial principles, the rates may be lower than in America.

Q. What do you mean by disregarding commercial principles? A. A concern operating a telephone plant expects to meet all of the expenses incident to that operation, and obtain a fair return upon the capital invested. As far as I have been able to ascertain, as far as my observation goes, in the foreign countries where the government owns a system, it is operated in connection with the telegraph. No separate accounts are kept, and it is impossible to say with accuracy whether the business is conducted with a loss or not. In other places, the government has privileges in the way of rights of way which a business concern would not have. It is such conditions as these that I refer to when I say "without regard to commercial principles."

Q. You spoke of the difference in the purchasing power of money. What do you mean by that? A. I mean that we Americans are required to pay very much higher wages to all classes of employes than are paid in any European countries that I know of. This is due to the fact that money goes farther there in buying the necessaries of life. Their labor bills are cheaper. Rents and transportation and all of the various items that enter into the conduct of a great business can be obtained for a less number of the same units,
2093 whatever you choose, in any European country, than in America.

Q. How is it as to the material used in telephone construction and operation? A. As to some items of material, the cost would be less here and greater there and greater here and less there; but it is not so marked as in the labor items, and so on.

Q. You spoke also of some differences in the kind of service furnished. What do you mean by that? A. You mean as to Europe?

Q. Yes. A. In Germany they furnish only a day service, no night service. In Berlin the lines are all ground circuits; and, generally speaking, I think the service in no foreign country is maintained at the high degree of efficiency that is maintained in New York, or generally maintained in cities of the same size in America.

Q. Is there any custom in the foreign countries in reference to a subscriber paying anything besides the rate per annum?

Mr. BIRNEY: Objected to as not matter in rebuttal.

A. Yes; in some places there are installation charges, or entrance fees, as they are called. In some places the subscribers buy their own outfits; and you will find different conditions and different special charges in almost all these various places. I would not attempt to particularize.

Q. In Paris, how are the underground cables laid? A. In the sewers.

2094 Q. Did you make any effort to ascertain as to these European exchanges whether the business was carried on at a profit or at a loss? A. Not in any way, except from literature on the subject, open to anybody.

Q. Have you seen an article which bears upon that subject in Chambers' Journal for May, 1899? A. Yes; I have read that article.

Q. Is that journal a reputable periodical? A. I so understand it; yes, sir.

Counsel for defendant here produces the copy of Chambers' Journal for May, 1899, and refers to an article therein entitled "The Telephone," beginning on page 310, and reads in evidence therefrom the following passage, beginning on page 311:'

"Until comparatively recently the Telephone Company owned not only the local or exchange system, but the trunk service as well. The Post Office now owns and works the latter with the result that it is the most extensive in Europe; while the exchange service, which is almost wholly in the hands of the company, and chiefly confined to 'subscribers,' is much behind that of some continental countries. Within the London telephone area, containing a population of over six million persons, there are only two hundred and thirty-seven call offices open to non-subscribers for the transmission of messages, while in Stockholm there are seven hundred for a population of only a quarter of a million. Probably there are local conditions

2095 which would tend to modify this statement so far as Stockholm is concerned, and possibly the service is carried on under conditions which are more or less peculiar to continental countries. One expert witness, indeed, before the recent select committee pointed out that the Stockholm telephone area embraces a large tract of country extending to a radius of forty-two miles around the town and covering an area of something like 1,200 square miles. Prbably the population is not great outside Stockholm itself, but it is only fair to make some allowance for the exceptional area in proportioning the telephonic facilities of the Swedish capital to its population. Again, it was stated that in Sweden the subscriber to the telephone is called upon to find part of the capital out of which the system is provided; that is, he has to pay a sort of 'entrance fee,' which practically amounts to the cost of the apparatus, leaving only the cost of constructing the line to be otherwise provided for. Still, in Sweden the cost of the service is very low, being only something like £14 10s, as compared with £17 in London. This is brought about by the tremendous competition between the State and the company, the result being that both

systems are worked at a heavy loss. In Germany, where the system is entirely in the hands of the Government, the rate is uniformly £7 10.; but here, again, the service is said to be carried on at a loss. Nor is it a good service, for it is entirely on the single-wire system; and so much inconvenience is experienced in Berlin from this circumstance that the authori-
2096 ties contemplate introducing the 'metallic circuit' everywhere at a very large cost. It is only in Hamburg, Berlin and Cologne that telephonic development has reached any very marked degree in Germany. Their trunk system will not compare for a moment with ours, England having something over nine hundred trunk services now at work, while Germany has something under six hundred. Still, the fact remains that while Berlin, with little more than a million and a half of population, has over thirty-six thousand telephones, London, with its four millions and a half, has less than twenty-six thousand; and, again, Hamburg, with a trifle over half a million inhabitants, has thirteen thousand five hundred telephones, while Liverpool, with eight hundred thousand people, has only about eleven thousand. Cologne, again, is phenomenally developed in the matter of telephonic facilities, there being one telephone to every thirty-six of the population—a proportion which speaks badly for the restfulness of the 'City of Smells.' Through the whole of Switzerland the number of telephones per head of the population is about one per hundred; but, on the other hand, in the large towns, where the exchanges are very fully developed, the number increases to such an extent that in Geneva it is one in twenty-three, in Lucerne one in twenty-four, in Bale one in twenty-nine, in Berne one in twenty-seven, and so on in numerous other instances. The rates in Switzerland are partly by subscription and partly by toll—the sub-
2097 scription ranging from £4 for the first year to £1 12s. for the third and subsequent years, and the toll being levied on every separate 'talk' or conversation. They have carried the system so far in Switzerland that they have what are called Communal Parish Call Offices, and these sometimes develop into sub-exchanges, from which telegrams and 'phonograms' are delivered, the latter being a sort of express letter, of which the contents are telegraphed or telephoned. It is extraordinary to what an extent the telephone has been developed in quite small countries and States; such, for instance, as the Grand Duchy of Luxemburg, in Finland, in Norway, and even in Jutland. In some of these even the villages of two hundred or four hundred inhabitants have their exchange, while nearly all have their call office or other telephonic convenience. In Jutland the service is carried out by small companies as a rule, the maximum rate being £1 3s. 4d. per annum and the minimum £2 10s. per annum. In neighboring Schleswig-Holstein, where the

service is carried on by the German Government, the uniform rate of £7 10s. is charged, so that there must be a leakage somewhere if the local companies pay, seeing that it has been stated that the German system does not pay. On the whole it is probable that the Swiss system is the most perfect and most widely extended; but here again there is a strong suspicion that it is carried on at a loss, although it is very difficult to get at the actual facts of the case. The matter is important, however, as bearing on the comparison with the English system, as
2098 it is pretty certain that a service which did not pay its way would not be tolerated in this country."

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Bethel, do you know who wrote the article in Chambers' Journal which has just been shown you? A. No, sir; I do not.

Q. Do you know who are the editors of that Journal? A. No, sir; I do not.

Q. Is that Journal devoted in any way to electrical matters or telephone matters? A. I think not.

Q. It is a magazine which publishes a variety of articles on all sorts of subjects, is it not? A. All sorts of subjects; yes, sir.

Q. The article immediately preceding the one which has been shown you is entitled "The Red Rat's Daughter," is it not, and is a story, so-called, is it not? A. I haven't read it, and I cannot testify to its character.

Q. That is the title, anyhow? A. That is the title; yes.

Q. Referring to the article entitled "New York Telephone Company," published in the Elektrotechnische Zeitschrift, please give the name of the gentleman who communicated this matter to the German paper. A. Bernard Hoffman.

2099 Q. What is his position with the New York Telephone Company? A. At the present time, or at that time?

Q. What was it at that time, and what is it now? A. At that time he was manager of one of the central offices of the system. At the present time he is chief clerk in my office.

Q. Which office did he manage? A. He was manager of either 18th street or 38th street.

Q. At that time how many exchanges did you have in New York? A. Twelve.

Q. Are they properly named in the table attached to the article which you have read? A. Yes, sir.

Q. Have you compared the figures in the tables which you have produced, Bethel No. 1, Bethel No. 2, Bethel No. 3 and Bethel No. 4, with the figures in the translation? A. No, sir; I have not made any comparison.

Q. Do the tables which you have produced cover the whole of your territory? A. No; not that portion of the territory outside of New York City.

Q. Then the number of stations shown on these exhibits is the number of stations directly connected with the twelve switchboards or exchange stations in New York City? Am I right? A. These figures, so far as they relate to a time when we had twelve offices in New York City, cover the sta-

2100 tions connected with those twelve central offices. We have more than twelve central offices to-day, and the figures relating to the conditions on June 1st last show the number of stations connected to the central offices that we had on June 1st. As to the whole period of time covered by the statement, they show all the stations connected with all the central offices in old New York City, now the boroughs of Manhattan and Bronx.

Q. Then these tables do not include any of your subscriber's stations lying outside of the city proper or old New York, as we may call it? A. No.

Q. How many exchange stations or central offices have you now in New York City? A. Sixteen, including one opened to-day, or to be opened to-day.

Q. Does that mean old New York City, Manhattan and the Bronx? A. That means Manhattan and the Bronx.

Q. What is the largest number of lines attached to any one station, exclusive of trunk lines? A. I can't state the exact number, but something less than five thousand.

Q. Where is the largest switchboard? A. At the Cortlandt street station.

Q. How long have you had for examination on the translation "Elterich No. 1," and its accompanying tables? A. A little more than one week.

2101 Q. From whom did you receive it? A. From Mr. Fuller, by mail.

Q. The manager of the Chesapeake & Potomac Telephone Company? A. Yes.

Q. With that document in your possession, did you make any effort to verify the figures given in it? A. No; I made no effort, because I did not know the course this inquiry was to take, or that you would expect to test its accuracy through me.

Q. Have you examined those tables or the translations made of those tables and the figures which they give? A. No.

Q. What examination have you made of the statements contained in the tables attached to that original article? A. None. The tables were not sent to me.

Q. When did you first see those tables? A. I saw this paper and these tables (referring to the German paper) within a reasonable time after its publication; that is, I saw these figures some time in 1898.

Q. Did you then look them over and learn what they meant? A. In a general way, but not to test their accuracy, specially.

Q. Did you then or have you since discovered any inaccuracies in them? A. No.

2102 Q. Can you tell us how many subscribers' lines are cared for by each operator upon an average in New York City at the present time? A. It varies. Flat rate lines are heavily used, and a much less number of them can be handled by an operator than message rate lines. Roughly speaking, an operator handling flat rate lines would answer about sixty subscribers. One handling entirely message rate lines might answer one hundred and even one hundred and twenty lines.

Q. Do you divide your lines in that way between the operators, giving to one operater flat rate lines only and to another message rate lines only? A. In some cases the operator will handle only one class of lines, but frequently, in order to properly distribute the traffic, an operator will handle both flat rate and message rate lines. There is no general rule, although there are cases, on which my statement is based, where an operator handles only one class of lines or the other.

Q. How many such cases approximately are there? A. With eighty-five per cent., say, of our lines on a message rate basis, you can see there would be a great many such cases; but I am not able to state off-hand just how many such cases there are.

Q. Do you mean to say there are a great many such cases where the operator handles only flat rate lines? A. Yes. There are not as many flat rate cases as message rate cases, because of the larger number of message rate lines.

2103 Q. Are your flat rate subscribers generally connected with the exchanges in the business part of the town only, or do you find them all over your district? A. They are all over the city. Of course the larger number are in the lower part of the city, that is, the strictly business district, because a moderate user would go on the message rate plan.

Q. What proportion, if you can approximate it, of the number of your flat rate subscribers is in the purely business district of the city? A. You are not asking me to give exact figures?

Q. No; unless you can do so. A. I cannot, without consulting the record. I could tell you that, of course. Do you mean in business district or in business places?

Q. Put it both ways. A. That depends again on what you call the business districts.

Q. What would you call the business districts? A. I suppose the uptown districts would be slandered if I would call only the downtown districts business districts; but generally speaking, you will find very few, if any, residence telephones

south of Eighteenth street. Therefore we will call that the business district, bearing in mind that a very large business is done through the center of all the other districts, except perhaps the Columbus, and those on either side of Central Park and in Harlem. In what I have described as the business district, the lower end of Manhattan Island, I
2104 should say that this business district contains about eighty per cent. of the total number of flat rate stations; and, answering the other question, I should say that there is perhaps not a two hundred and forty dollar flat rate telephone in a residence. There were old residence flat rates, to which I have not referred, of one hundred and eighty dollars a direct line. There are a few lines at this old rate still in force. How many I am not able to say, but it is a very small number.

Q. Have you, as manager of the company, from time to time determined the average number of daily calls per subscriber at the different exchanges in New York City? A. Yes, sir.

Q. When did you last have a count made? A. On the 10th day of June, unless that was a holiday or Sunday. Say less than a month ago—about a month ago.

Q. What was then the average number of daily calls in the city of New York? A. I do not remember. It is about ten.

Q. In which of the exchanges did you find the largest number of calls?

Mr. WORTHINGTON: Do you mean the largest gross number or the largest in proportion to subscribers?

Mr. BIRNEY: The largest average number in proportion to the subscribers.

A. I wouldn't like to say just which exchange I found the largest number of calls per line in; but I would say that our general experience in recent months has been that the largest number of calls per line is made in one of the down town business districts, and generally speaking, I should say
2105 that the district which has the largest proportion of flat rate lines would give us the largest number of calls per line. That is our experience.

Q. Which is that exchange? What is its name? A. That is just what I said I would hardly be able to answer accurately, but taking it from memory and not from the examination of statistics before me, I should say our Broad street exchange.

Q. Do you recall the average number of calls at that exchange? A. No; I do not.

Q. Table 3 in the Berlin paper offered in evidence states the average daily calls per subscriber's line at the different ex-

changes then in operation in New York City, at the time covered by his article, to have been as follows:

Broad Street, 13.7.
Cortlandt, 11.7.
Franklin, 12.5.
Spring, 9.2.
Eighteenth Street, 12.
Thirty-eighth Street, 9.7.
Columbus, 7.5.
Seventy-ninth Street, 7.6.
Harlem, 7.8.
High Bridge, 3.4.
Melrose, 4.7.
Tremont, 4.5.

Have you made any examinations to determine if that is correct? A. That is, to determine the accuracy of those
2106 figures?

Q. Yes. A. I have already stated that I had not tested the accuracy of these figures; but, generally speaking, I should say that they are correct. That is, my experience would bear out that relation.

Q. From your experience you would say that these figures are approximately, at least, correct? A. Yes.

Q. How frequently do you take your counts? A. Once a month.

Q. In the Broad Street exchange how many subscribers' lines are there to each telephone operator's position?

Mr. WORTHINGTON: Do you mean now, or at the time that table refers to?

Mr. BIRNEY: Now.

A. The number of lines per operator in Broad Street probably varies at different points in the board, in order that the traffic may be properly distributed. That is, that the load may be properly distributed among the operators who are called upon to handle it, so that I could not give you one figure that would answer your question, and I would not be able to give you exact data from memory; but I should say that in Broad street we would come nearer sixty, or even less, than in any other of the exchanges.

Q. Do you know how many operator's opsitions there are at your board in the Broad Street exchange? A. At that time?

Q. Either now or at the time referred to in the arti-
2107 cle. A. At the time referred to in this paper there were thirty positions. You mean assuming this table to be correct?

Q. Yes; the statement in the paper is correct according to your recollection? A. Yes; I see by looking at it that it con-

firms the answers that I have given to your previous questions, substantially.

Q. Those were given from your recollection? A. From my recollection; yes, sir.

Q. At the time referred to in that Table 3, how many lines in the Broad Street exchange were cared for by each operator, upon an average? A. About sixty-two.

Q. And what was the average of the lines cared for by each operator in the entire city? A. 67.4. The range is from 58.5 in Cortlandt to 135 at Melrose, the average being 67.4.

Q. The subscribers at the Broad Street exchange are nearly all business men, are they not? A. Yes, sir.

Q. And the subscribers there are many of them brokers, commission merchants and persons of that character, are they not? A. Yes, sir.

Q. Is not that the most active exchange in the city?

Mr. WORTHINGTON: I object to that word "active" as being ambiguous. I do not know what counsel means, and I
2108 surmise that the witness may not.

Mr. BIRNEY: If the witness does not understand me, he will say so. A. Understanding that you mean by "the most active" the one which handles the largest number of messages per line, I will say that that is the most active exchange.

Q. Have you made records from time to time of the average number of calls among your flat rate subscribers? A. Yes, sir.

Q. When did you make the last count of that kind? A. About a month ago.

Q. What was the average number of daily calls? A. I couldn't say. I don't remember.

Q. Can you not recall it, or about the number? A. At the last count, or at some previous count?

Q. If you say you cannot recall the average at the last count— A. I cannot recall the average at the last count.

Q. What count can you remember, if any? A. When all our lines were flat rate lines and there were about eight or nine thousand stations in the system, our average calls per day—

Q. I have not asked you that; but proceed. A. I thought it was what counsel wanted.

Q. You went back much farther than I supposed from your answer you intended to go. A. Shall I finish it?

Q. If you choose. A. The average calls per line, as I remember, was about fourteen or fifteen per day. The
2109 moderate users, those nine thousand, have subsequently gone over to the message rate basis, leaving the large users on flat rates. I therefore would say that at our recent counts, the average calls per flat rate line were much higher

than fourteen or fifteen per day. The average of all the lines is about ten per day.

Q. Can you recall the count of the flat rate lines at any time in the last year? A. No, sir; may I ask my assistant, who is here?

Q. Yes; just put it on the record. A. I cannot recall it.

Q. Can you state what number of the total number of telephones shown in the Table 3 in the Exhibit Elterich No. 1, were business telephones, and what number were residence telephones? A. No, sir; I cannot. I have no means of telling that, from any data I have here.

Q. Is there anything in the tables which you have produced which would show? A. No, sir; not as between business and residence telephones.

Q. Do you keep a record which distinguishes those two classes? A. Yes, sir.

Q. And can you now approximate the number of business telephones of the 31,241? A. I am sorry that I cannot recall the number of residence telephones that we have now.

Q. Mr. Bethel, will you tell us what was the extent of your investigation of the telephone system in England?

2110 A. I spent about a week there, and was, through the courtesy of the general officers of the National Telephone Company, and through the engineers connected with the Postmaster General's Office, permitted to make a very careful and thorough examination of the system, their practices, etc.

Q. How did you conduct that examination? What did you actually do? A. I personally looked at one of their central offices, some of their line construction, and talked with the persons I have mentioned.

Q. That was the extent, then, of your investigation? A. At that particular time.

Q. At what other times have you investigated that plant or system? A. I have not personally inspected the plant, but last year I had an opportunity to talk several times with those who had to do with the management of the system there. Perhaps the fullest information I have obtained respecting conditions in England is shown by the testimony taken by the Parliamentary Committee that sat last year, and the report of that Committee.

Q. You have read that report and gained your information, then, largely from that? A. I have read that report; yes, sir, and gained my information largely from that.

Q. What investigation did you make of the system in Norway, Sweden and Denmark? A. In Norway, in travelling through the country, I saw some of their line construc-

2111 tion. I visited the central office at Christiania. I then went to Stockholm, where I was shown their main office and some of their other offices, and their line of construction, and had an opportunity to talk frankly and fully with the managers and engineers of that company. In Copenhagen my examination was very brief. I inspected the central office, accompanied by the managing officer of the company, and had conversation with him during that inspection.

Q. Did you speak with him in English or in Swedish? A. English. They speak English very nicely, except that the general manager of the Stockholm Company does not speak English fluently, but his friends and other members of his family, some of whom were with us all the time, made it perfectly easy to converse with him about these matters.

Q. How much of the time did you spend in the exchange of Christiania? A. I don't recall the exact time. You understand I did not make an inspection of it as an engineer, or examine into the details of it, but it was such an inspection as the manager of one company would show to another, showing him the general arrangement of the several parts making up the exchange, and how his system worked, and general matters of that kind.

Q. Was that the same course of proceeding in Stockholm? A. No; in Stockholm the examination was more in detail, and more fully, because I was personally acquainted with the general manager of the telephone company there, and he showed me considerable attention.

Q. Which telephone system did you examine, that of the Government or that of the incorporated company? A.
2112 The Allmanna—the general telephone company.

Q. Did you ascertain the number of instruments in operation in that exchange? A. Yes, sir.

Q. Do you recall the number? A. No; I don't recall the number now that they had at that time.

Q. Did you examine the Government exchange? A. No; the Government exchange at that time had a very small number of subscribers connected with it, and it did not happen to come my way. There was no opportunity for examining it, and I made no examination of it.

2113 Q. You have stated that some of the companies in some of the European States require subscribers to pay a certain sum at the time of installation, either a part of the cost of installation or all of it. Do you know whether that is true in any sense in the Swedish system? A. Yes; in Stockholm—may I refresh my memory by reference to a paper, which will enable me to give you the exact amount?

Q. What paper is it?

Mr. WORTHINGTON: A memorandum be made for me.

A. A memorandum about the Swedish rates.

By Mr. BIRNEY:

Q. Made when? A. Made about a year ago.

Q. And from what source did you get the information? A. From Mr. Cedergren, the general manager of the Allmanna Company.

Q. By whom was the memorandum made to which you are about to refer? A. By my stenographer, under my direction.

Q. Was it at your dictation? A. I should not like to call it dictation. I made rough notes during my conversation with Mr. Cedergren, and my stenographer wrote them out for me, and I probably revised them and had them rewritten.

Q. Will you not let me look at them?

(The witness handed the paper in question to counsel for the complainants.)

Q. Does this memorandum which you have shown me
2114 contain the statistics of the number of subscribers and schedules of rates communicated to you by the general manager of the Stockholm company, whom you have mentioned? A. Yes, sir, it does, in August, 1898.

Q. Will you state, for information, on the record, the amount in American money of a kroner? A. About twenty-seven cents.

Mr. BIRNEY: Counsel for the complainants now ask the examiner to insert in the record the memorandum produced by the witness.

(Counsel for the defendant having no objection to the introduction in evidence of said paper, it was agreed by and between counsel that the same may be copied by the examiner, as follows:)

TELEPHONE STATISTICS. STOCKHOLM. AUGUST, 1898.

Number of Subscribers.

The Allmanna and Bell Companies have about 13,700 subscribers in the city of Stockholm, and about 3,000 in the suburbs.

Between 9,000 and 10,000 lines are on a flat rate basis, and on these lines about 13 or 14 calls are made per day.

Schedule of Rates.

(All lines metallic circuit.)

Charge per year.

36 Kr. Message rate line (residence only), 400 messages per year, to be used 100 quarterly. Installation charge
2115 of 10 Kr.

45 Kr. Message rate line, 400 messages per year, to be used 100 quarterly. Installation charge of 10 Kr.

60 Kr. Flat rate party line, arranged so that both subscribers can be called simultaneously or either one call while the other is being called, but so that but one station can call at any one time. Installation charge of 10 Kr. per year for five years.

80 Kr. Flat rate direct line. Installation charge of 10 Kr. per year for five years.

100 Kr. Flat rate direct line ("Star"). No charge to M. R. lines when calling a line of this grade. No extra charge for installation.

An additional charge of 10 Kr. is made for a desk set, instead of regulation wall set, under any contract other than that of 100 Kr. per year.

Tolls.

No tolls are charged for calls to any points in the company's territory (70 KM. rad.) except on calls to the Government system; for such calls a toll of 10 ore per message is made.

Suburban Rates.

Message rate contracts in the suburban districts are made at a rate of 25 Kr. for service other than to or via the city of Stockholm, and the rate of 50 Kr. per year for service anywhere in the company's territory is afforded.

By Mr. BIRNEY:

2116 Q. You have said that in the exchanges operated by the government in Europe, or in some of them, "commercial principles are ignored," and have explained what you mean by "commercial principles" in that connection. Do you know if this statement applies to the government exchange or telephone system in Sweden? A. No, I do not.

Q. Do you know if it applies in France? A. I understand that in Paris they use the sewers, and are thus relieved of subway charges; that the building in which the central office is located is a government building; and that by reason of the system being operated by the government, they have many privileges which they would not have if it were operated by a com-

mercial concern; and to that extent I think commercial principals, as I have defined them, are not observed.

Q. How did you acquire your information as to France in this particular? A. Largely from a report made by Mr. Herbert Laws Webb, who made an examination of the telephone conditions in Europe a few years ago; and through conversations with a gentleman from Paris, who spent considerable time here last year investigating American conditions.

Q. What was his connection with the telephone business in France? A. I am not sure that he was connected with the government department—that is, officially connected with the government service—but he is a telephone engineer who
2117 plans much of the work done by the Paris company.

Q. Is the business in Germany carried on by the government, or by private corporations? A. By the government.

Q. Exclusively? A. I think so.

Q. Are you sure of it? A. I would not say as to the whole empire.

Q. Is it carried on exclusively by the government in the City of Berlin? A. I think so.

Q. Are you sure of that? A. As sure as I can be of any fact gained from the ordinary sources open to you and to me.

Q. Have you ever made any investigation particularly with reference to that? A. Yes, Mr. Webb made a very full report on the conditions in Berlin; and I have, from various other sources, gathered information respecting Berlin; and in my own mind, there is no doubt that the government conducts the telephone business in Berlin exclusively.

Q. How is it in Switzerland? A. In Switzerland it is a government undertaking. May I say one word?

Q. Certainly; you have the right to—A. As to Switzerland, I rely as much upon a statement in the Statesman's Year-Book for last year respecting the rates and expenses (that is, on the question of whether or not the service is conducted at a
2118 loss) as upon the magazine which has been referred to.

Q. The Chambers Journal? A. Yes, sir; and upon other sources.

Q. Are those other sources any more reliable than the unsigned, unauthenticated article in the Chambers Journal? If so, what were they? A. The Statesman's Year-Book for last year contains a statement respecting Switzerland, in which it says—

Q. One moment; have you that book here? A. No; I have not it here.

Q. Then I object to your stating its contents.

Mr. WORTHINGTON: You can go on and finish your answer.

The WITNESS: You asked me for my sources of information.

Mr. BIRNEY: I did not ask you to state the contents of a book.

The WITNESS: The Statesman's Year-Book contains a statement with reference to the earnings and expenses of the telephone business in Switzerland for the year, being, in effect, that the receipts amounted to a certain sum and the expenses to the same.

By Mr. BIRNEY:

Q. Do you know what are the rates charged in Switzerland? A. I could not give you a schedule of rates in Switzerland from memory.

Q. Can you state the highest and the lowest rates for flat service? A. For flat service?

2119 Q. Yes. A. Do you mean to say that there is a flat service there?

Q. I ask you if there is such; if you can state the rates of charges. A. No; the telephone rates in Switzerland are based on the message-rate principle.

Redirect examination.

By Mr. WORTHINGTON:

Q. Mr. Bethel, you stated that in New York you take a count once a month. Does it ever happen that those counts happen to be taken on special occasions, which influence the number of calls in particular exchanges and not in others? A. Yes; there may be an unusually active day on the stock and other commercial exchanges, which would produce a larger business in the part of the city where those exchanges are located. The weather has a very large influence upon the traffic, and the steamer day might affect the traffic in some portions of the city; so that there are various things affecting the traffic in particular spots or as a whole.

Q. To what extent, then, are the figures for a single day a safe guide in estimating the relations of the different parts of the business to one another? A. I should say, taking them on the whole, they are a fair measure of the work done. If you take twelve days during the year, it is easy to compile figures that could be relied upon.

Q. I am speaking of a case where you do not have the

2120 benefit of a statement taken each day of the month for a year, but where you have before you only a single statement of one day's count, without knowing anything about the others. A. I should not base important plans on the results obtained one day, without checking them carefully.

Q. In the different exchanges in New York, do you use the same type of switchboard? A. No, sir.

Q. Does the character of the switchboard have anything to do with the number of lines cared for by a single operator? A.

It might have an influence upon the amount of work that could be done by a single operator.

Recross-examination.

By Mr. BIRNEY:

Q. What different styles of switchboard do you use? A. Standard, multiple, divided and relay.

Q. How many multiple boards have you?

(The witness did not answer immediately.)

Mr. WORTHINGTON: Can you state the number?

The WITNESS: No; I cannot state offhand the number of boards of these various types. I would say, generally, that we are now reconstructing our plant, and, as rapidly as the conditions will warrant, replacing all of the boards in use with relay boards.

By Mr. BIRNEY:

Q. Do you know how many of the divided boards you have? A. No.

2121 Q. I do not remember if I asked you this question—if not, I will do it now: Can you tell me the average number of subscribers to each operator at present in your system in New York City; that is, the average number of lines cared for by each operator throughout the twelve exchanges? A. I think I have answered that.

Q. No, I think you gave it to me as in 1897. Can you state it now? A. I should say, speaking of the present conditions, it varies from fifty-eight or sixty at one end to one hundred or one hundred and twenty at the other.

Q. Dealing with the system as an entirety, what is the average number of lines cared for by each operator? A. If I had the last peg count, I could give you that absolutely.

Q. Can you not remember it? A. No; I do not remember it.

Q. Will you furnish that to the examiner? A. I will, if there is no objection.

Mr. BIRNEY: I request, then, that you send it to the examiner for insertion at this part of your deposition.

UNION N. BETHEL,
By the Examiner by Consent.

Subscribed and sworn to before me, this —— day of ——, A. D. 1899.

———— ————,
Examiner in Chancery.

(The witness subsequently furnished the examiner information that said average number of lines to each operator was 61.2 at date of last traffic count, June 12th, 1899.)

2122 HERBERT LAWS WEBB, a witness of lawful age, called by and on behalf of the defendant, in rebuttal, having been first duly sworn, testified as follows:

By Mr. WORTHINGTON:

Q. Where do you live, Mr. Webb? A. In New York.

Q. What is your present occupation? A. I am with the New York Telephone Company, with no special title, but in the General Manager's Department.

Q. You are in the department, then, of which Mr. Bethel is the head? A. Yes.

Q. How long have you been connected with that department? A. About six years.

Q. Had you any telephonic experience pior to that? A Yes; prior to that I was about two years in the engineering department of the same company.

Q. Have you at any time gone to Europe for the purpose of investigating telephone service and rates there? A. Yes.

Q. When did you go? A. In 1894 and again in 1897.

Q. At whose instance did you go on each occasion? A. I went in the first instance for the American Bell Telephone Company, and in the second instance I was called over by the National Telephone Company of England to give evidence, and I remained over some time after that to report for my own

2123 company, the New York Telephone Company.

Q. How long were you in Europe in 1894? A. About six months.

Q. And in 1897? A. About two months.

Q. What countries did you visit and what principal cities in 1894? A. I visited Great Britain (that is, England and Scotland), Norway, Sweden, France, Belgium, Germany, Austria and Switzerland.

Q. And in 1897? A. In 1897 I was only in England—in England and Scotland.

Q. When you went to these various places, in a general way, what did you do for the purpose of getting information of the kind you were seeking? A. In most of the places I investigated the system practically from top to bottom and also obtained copies of official documents and rules and regulations, and had them translated, and so on.

Q. What familiarity had you, before you went there, with the telephone systems in this country, outside of the one in New York with which you were connected? A. Very little outside of New York. I had stayed some time in Chicago and in Boston; but otherwise I had no telephone experience outside of New York.

Q. As to telephone rates in particular, what did you ascertain in these countries as to how they compare with those in

New York and in this country as far as you know them?
2124 A. In a general way it is very difficult to make those comparisons unless you take into account all the different conditions, and those conditions vary practically in every case.

Q. Did you make any effort to ascertain whether the business in those countries was done at a profit or otherwise? A. One always tries to ascertain that; but of course it is a delicate question to ask of the manager of any company. If you ask him what his working costs are he invariably declines the information or evades it, just as I do when I am asked the same question over here. It is naturally information that you have not the right to give a stranger. As regards the government systems, I should say that it is generally admitted that they are not run at a profit.

Mr. BIRNEY: That is objected to as being a statement of vague hearsay.

By Mr. WORTHINGTON:

Q. What admissions, if any, of that kind did you have from those who were in charge of or connected with any of these government systems? A. I questioned the officials in Berlin on that subject, and the general answer was that the telephone system was run practically as part of the telegraph system, and the accounts were kept all in one, so that they could not really tell whether the telephone system *per se* was run at a profit. But I will add to that that some of the officials did state that they did not believe that any profit was made on the telephone system.

2125 Q. Are there any other Government systems in Europe in which the telephone and the telegraph are run as one department? A. Yes; that is the case in Switzerland, and in France, and, at the present time, in Austria.

Q. In London, how was the business done—on the flat rate or measured service system? A. It is entirely on the flat rate.

Q. And what were the rates? A. The standard rate in London for metallic circuit service on a yearly contract was one hundred dollars. That is subject to a mileage charge if the station is beyond a certain distance from the exchange.

Q. How was the rent payable? A. Yearly in advance.

Q. Was the system in London overhead or underground, or partly each? A. It is principally overhead. They have a small proportion of underground work, which they are adding to at the present time.

Q. In the underground construction do they build subways, or how do they get their cables underneath the ground? A. They largely use the County Council subways that run under the new streets in London.

Q. In other cities in Great Britain what was the customary rate? A. In other cities the regular rate is fifty dollars a year.

Q. In those cities do they have overhead or under-
2126 ground systems, metallic or grounded circuits? A. Up to within a few years ago they were almost entirely overhead, and entirely grounded ircuits. At the present time they are changing them gradually, one set after another, to underground distribution and to metallic circuits.

Q. Did you ascertain how the compensation of operators in the exchanges in England compares with that of operators in this country? A. Yes; in a general way, the rates of pay in England are about one-third to one-half of the rates in New York.

Q. What are the rates in New York with which you are making this comparison? A. The rates of pay?

Q. Yes, of operators. A. An experienced operator in New York gets nine dollars a week. They start in at three, as learners; and when they are capable of taking a responsible position, a busy position, they get as much as nine dollars a week.

Q. And do they run between three and nine, as they progress in ability and experience? A. Yes, sir.

Q. How does the pay of linemen, inspectors, wiremen, foremen, etc., in England compare with that in this country? A. Generally, I should say, the comparison is about the same—they get about half.

Q. What is the rate in Paris? A. The rate for telephone service?

Q. Yes. A. Eighty dollars a year.

2127 Q. Does the subscriber have anything to pay, except the annual rent? A. Yes; the subscriber has to buy his station apparatus, his telephone set, and also has to pay for extending the wire ffrom the sewers to his premises.

Q. Are the cables carried in the sewers there? A. Yes, very largely.

Q. And does the Government own both the telephone service and the sewers? A. The National Government does not own the sewers, but I think it exacts the right to carry its cables through the sewers.

Q. It maintains its system, then, without any expense except the— A. Yes, it pays no charge to the municipality for carrying its cables through the sewers.

Q. Are there any other large systems of telephone exchanges in France except that in Paris? A. There is no large system; no—that is, there is no system of more than about a thousand subscribers.

Q. What is the standard rate for telephone service in Berlin? A. Thirty-seven dollars and a half.

Q. Is that metallic circuit, or grounded? A. That is entirely grounded circuit.

Q. Do they run the service through the entire day, or only part of it? A. No; the service is limited from seven in the morning till ten at night.

2128 Q. Do you know whether or not there has been any official publication or announcement as to whether the telephone system in Berlin is run at a profit or at a loss? A. I have read a report of the speech of the Minister of Posts and Telegraphs, in which he—

Mr. BIRNEY: Objected to unless the report be produced, that being the best evidence.

The WITNESS (continuing) In which he stated that he was unable to reduce the rate for telephone service, because the terms were already insufficient.

By Mr. WORTHINGTON:

Q. What is the rate in Vienna? A. I am not certain of the rate in Vienna at the present time. At the time I was in Vienna the system was run by a company, and it has since been taken over by the Government. To the best of my recollection the rate at that time was forty dollars, on a flat rate.

Q. Is that metallic or grounded circuit? A. My recollection is that it was grounded circuit.

Q. What did you find to be the rate in Stockholm, Sweden? A. They have a number of different rates in Stockholm. The rate for unlimited service, on a flat rate, was one hundred kroners, or twenty-seven dollars.

Q. Did the subscriber have anything to pay except this annual rate? A. Yes; the subscriber paid an installation charge also of a hundred kroners, or twenty-seven dollars.

2129 Q. Did you obtain any information as to whether or not the Stockholm telephone business carried on by the Government is run at a profit or a loss? A. No; I did not obtain any information on that point.

Q. You have said that in England the wages of operators and other employees of a telephone company were from one-third to one-half what is paid in New York. How did you find that in the other countries in which you have made your investigations? A. In the other countries the rates of pay, I think with the single exception of operators, are lower than the English rates.

Q. And as to operators, how do they compare with the English rates? A. As to operators, I think in most places on the Continent they pay them rather more than they pay them in England.

Q. What difference, if any, is there, generally, in the cost of material used in a telephone plant in European countries and here? A. That varies a great deal. Most material in which much labor enters is cheaper there than it is here—always excepting, of course, material that they have to import from here or from other countries.

Q. Taking the telephone plant as a whole, does the material in it cost more or less there than here? A. As a whole, I should say it costs less.

Q. Did you make any investigation as to the character of service furnished in these countries? A. Yes, in a very general way, in the way of testing the service myself from
2130 different points.

Q. How does it compare with the service furnished in New York? A. I should say, in a general way, that they fall considerably short of the standard of efficiency.

Cross-examination.

By Mr. BIRNEY:

Q. In whose interest did you go abroad, Mr. Webb? A. I went for the American Bell Telephone Company.

Mr. WORTHINGTON: In 1894?

The WITNESS: Yes.

By Mr. BIRNEY:

Q. How was it in 1897? A. In 1897 I went for the National Telephone Company of England, to give evidence at an inquiry over there; and I stayed some time after that.

Q. Are you yet in the employ, in any way, of the American Bell Telephone Company? A. I am in the employ of the New York Telephone Company at present.

Q. That company is a licensee of the American Bell Telephone Company, is it not? A. Yes.

Q. And the American Bell Telephone Company is a large holder of its stock?

Mr. WORTHINGTON: If you have any personal knowledge on that subject you can answer.

A. That is a subject of which I have no personal
2131 knowledge at all.

By Mr. BIRNEY:

Q. Have you any information on that subject? A. Simply from what I have read in the technical papers.

Q. To what extent does your information on that subject go? A. I have read it also in the report of an inquiry into the telephone business.

Q. And what is your information? What have you learned? What is the result of that inquiry? A. I thought you meant on that point—

Q. On that point—the ownership of stock of the New York Telephone Company by the American Bell Telephone Company? A. My information is that the American Bell Telephone Company does own stock of the New York Telephone Company, or did.

Q. What proportion of it; do you know? A. I do not know.

Q. Can you tell us the rates of pay of the operators at Stockholm, when you were there? A. They were paid at an hourly rate which brings their weekly pay, as I recollect it, to between two and three dollars a week.

Q. Have you any figures made at that time to refresh your recollection? A. No.

Q. Did you make a written report on these subjects
2132 upon your return? A. Yes.

Q. Have you a copy of that with you? A. No.

Q. Did you ascertain the cost of the subscriber's equipment at Stockholm? A. The cost of the instruments?

Q. Yes. A. Yes, I did at the time, but I do not recollect what the amount was.

Q. Can you not recall it by a little thought? A. I should not like to state the figure from memory; no. In going about like that, you collect a great number of figures; and it is scarcely fair to charge your memory with all of them.

Q. Where were the instruments made which were used there? A. In Stockholm, as well as I recollect.

Q. By whom? A. I think they were principally made by Ericsson.

Q. What other cities than London did you visit while in Great Britain? A. Liverpool, Manchester, Hull, Leeds, Newcastle, Edinboro and Glasgow.

Q. You found the rate in each of these cities, as I understand, to be fifty dollars per annum for unlimited service, as we term it? A. Yes.

Q. Is the system underground or overhead? A. At
2133 that time they were almost entirely overhead.

Q. Did the rates remain the same in 1897 as they were in 1894? A. Yes, I believe they remained the same.

Q. Can you tell us how many telephones were in operation in Liverpool? A. At what time?

Q. Either in 1894 or 1897. A. In 1897, to the best of my recollection, there were about eight thousand.

Q. And how many were in use in Glasgow? A. Glasgow, I think, was about the same figure. It was in the neighborhood of eight thousand; it may have been somewhat less; it may have been a few more.

Q. And how many in Manchester? A. Manchester I do not recollect.

Q. Can you approximate the number? A. But Liverpool and Glasgow were the two largest exchanges outside of London.

Q. So I supposed. Can you recall the number in use in any of the other cities you have mentioned? A. The other places were smaller places, where the subscribers ran from one to two thousand—that is, Leeds, Hull and Newcastle.

Q. You cannot recall with more exactness the number in each place? A. No; I cannot recall with more exactness without looking at the records.

Q. Give us in dollars, if you please, the average rates
2134 of pay to the operators in Great Britain. A. The operators get an average of about two dollars and a quarter to three dollars and a quarter a week.

Q. Is three and a quarter the highest pay that you learned of? A. My recollection is that that is the highest pay for a regular operator.

Q. Did you investigate that subject in 1897? A. Yes.

Q. Did you make a report upon it? A. Yes.

Q. And that is also included in the volume which you have not with you? A. I have not a copy of it with me; no.

Q. Where were the telephones made which you found in England? A. I think they are principally made in England.

Q. Do you know what they are styled in the market? A. I do not know that I exactly understand the question.

Q. What name was given them? What were they called? A. No; as a rule, they do not have any standard names. In the telephone business we know a telephone by its being a Blake set, or a long-distance set, and so on.

Q. What were these? Were they like the Blake set, or like the long-distance? A. They were principally Blake sets, at the time of my first visit; and later, they were substituting another transmitter.

2135 Q. Did you learn if these were manufactured by the telephone companies themselves or by other manufacturing concerns? A. Lately they have been manufacturing themselves. The National Telephone Company has a factory of its own.

Q. How was it in 1894? A. I believe then they bought most of them. They had the factory at that time, but I do not think they did manufacturing of instruments on a large scale.

Redirect examination.

By Mr. WORTHINGTON:

Q. I want to ask you whether you can tell us what was done in Sweden with reference to apparatus covered by patents, for which, in this country, the patentee would be entitled to a charge? A. My information on that point is that most of the improvements have been copied there and used without paying any royalty.

Q. During either of your visits to Great Britain were you present at an inquiry in Glasgow? A. Yes.

Q. With reference to telephone matters? A. Yes.

Q. Before whom was that inquiry pending? A. It was held before a Scotch legal official, a commissioner appointed by the British Treasurer.

Q. Did Mr. Cedergren appear before that body and
2136 testify? A. Yes.

Q. Did you hear him? A. Yes, I heard him.

Q. From the information obtained in that way can you tell us anything about financial methods or results in Stockholm or in Sweden as to telephone matters?

Mr. BIRNEY: This is objected to as clearly incompetent.

A. Mr. Cedergren gave evidence on the finances of his company; and that evidence was later thoroughly analyzed by the president of the National Telephone Company, Mr. Forbes, who showed that it was impossible to operate a company, according to the British law, in the same manner in which Mr. Cedergren's company was operated, owing to the fact that by far the greater proportion of their capital was borrowed money, and he showed, in that way, that the results which Mr. Cedergren claimed in the way of dividends, profits, were very misleading.

Q. Do you know whether the body before which the inquiry was pending reached any conclusion on that subject? If so, what was it?

Mr. BIRNEY: That is also objected to.

A. My recollection is that they did not attach any weight to Mr. Cedergren's evidence as to the possibility of operating a telephone system at certain rates.

Recross-examination.

By Mr. BIRNEY:

Q. Did Mr. Cedergren testify that dividends were in fact realized by his company? A. Yes.

2137 Q. At what rate upon the capital? A. Eight per cent.

Q. Per annum? A. Per annum.

Q. And over how many years did he say that had extended?

A. My recollection is that he said that they paid those dividends from the very beginning.

Q. How long had they been running, do you know? A. That I do not know accurately; no.

Q. Did you learn, in the course of your inquiries and investigations, whether the English company is paying dividends to its stockholders? A. Yes.

Mr. WORTHINGTON: The one that is charging a hundred dollars a year, do you mean?

The WITNESS: Yes.

By Mr. BIRNEY:

Q. The same company which is charging fifty dollars a year in the other cities you have named? A. Yes.

Q. What rate of dividends does it pay? A. They pay different rates on different classes of stock. As far as I recollect five per cent. is the highest.

Q. Do you know the amount of their capitalization? A. I do not know accurately. It is somewhere in the neighborhood of five millions sterling.

Mr. WORTHINGTON: For the whole of Great Britain, you mean?

2138 The WITNESS: Yes.

By Mr. BIRNEY:

Q. But one company is operating in these various cities, as I understand you? A. Yes; one company operates the local service in all the towns and cities of Great Britain.

By Mr. WORTHINGTON:

Q. It appears from Mr. Bethel's testimony that in your New York exchanges you use different kinds of boards. What kind of a board is used in the larger exchanges there? A. The multiple board, although there are different patterns of multiple board, too.

By Mr. BIRNEY:

Q. What other types of boards are used, Mr. Webb, in the New York exchanges? A. The standard switchboard in the small exchanges, and there is a temporary installation which is practically a divided board, and in the newer exchanges the relay board.

Q. How many of the exchanges are equipped with the divided board? A. There is only one exclusively divided board.

Q. Are there others that use the divided board in part? A. There are others that use it in part; yes.

Q. How many of them? A. I think three. I am not absolutely certain; I think three.

Q. And how many use the standard board? A. Pos-
2139 sibly three or four of those are used in the small exchanges in the northern part of the city.

Q. Which particular exchanges use the divided board in whole or in part? A. John street, Eighteenth street, Thirty-eighth street and Columbus street, I think.

Q. How long have those divided boards been in use? A. That I do not know.

Q. During all your connection with the company? A. A relatively short time.

By Mr. WORTHINGTON:

Q. How does it happen that you have used in several of the exchanges which you have enumerated a divided board added on to a multiple board? Why have you not extended the multiple board? A. I should say, in a general way, so as not to extend the multiple board or rebuild the exchange pending the production of a totally new system which will be a great improvement.

HERBERT LAWS WEBB,
By the Examiner, by consent.

Subscribed and sworn to before me, this —— day of ——, A. D. 1899.

———— ————,
Examiner in Chancery.

(The further taking of these depositions was thereupon adjourned until Monday, July 10th, 1899, at the same place,
2140 at 8:30 o'clock p. m.)

2141 Washington, D. C., July 10th, 1899, 8:30 o'clock p. m.

Met pursuant to adjournment, and adjourned until Wednesday, July 13th, 1899, at 8:30 o'clock p. m.

Washington, D. C., July 12th, 1899, 8:30 o'clock p. m.

Met pursuant to adjournment, and adjourned until Friday, July 14th, 1899, 8:30 o'clock p. m.

Washington, D. C., July 14th, 1899, 8:30 o'clock p. m.

Met pursuant to adjournment, and adjourned until Wednesday, July 19th, 1899, at 8:30 o'clock p. m.

Washington, D. C., July 19th, 1899, 8:30 o'clock p. m.

Met pursuant to adjournment.

Present on behalf of the complainants, Mr. Birney.
Present on behalf of the defendant, Mr. Wilson.

JOSEPH U. BURKET, a witness called by and on behalf of the defendant in rebuttal, having been first duly sworn, is examined.

By Mr. WILSON:

2142 Q. Where do you reside? A. At the present time at Linden, Maryland.

Q. How long have you resided there? A. Fifteen days.

Q. Where did you reside prior to that? A. 713 H street, Washington, D. C.

Q. How long have you resided in Washington? A. Since 1864.

Q. What is your occupation? A. At the present time electrical inspector for the Board of Fire Underwriters.

Q. How long have you occupied that position? A. In the neighborhood of three years.

Q. Prior to that what were you engaged in? A. The electrical construction business.

Q. How long were you engaged in that? A. Since 1870.

Q. I show you a paper known as the Electrical Review, and will ask you to state what you know of it, how long you have known of it, and to what it is devoted? A. I have known of the Electrical Review since—well, in the neighborhood of 1875 or 1876. I have subscribed to it from year to year up to within the past ten years. During the past ten years I have purchased it from time to time, and have been generally a constant reader of it during that time. I have always considered it an authority on general electrical subjects.

Mr. BIRNEY: Counsel for the complainants here object to the taking of any testimony at this hearing except such as shall concern the telephonic plant in the Interior Department,
2143 on the ground that the time for taking testimony by the defendant has been passed, and that it was distinctly agreed with one of the counsel for the defendant that no testimony should be offered at this or any other session to be hereafter held, except such as shall relate to the Interior Department's telephone plant, counsel for the complainants having objected to a further extension of time for any other purpose.

Mr. WILSON: Who was the counsel with whom you had the arrangement?

Mr. BIRNEY: Mr. Hoehling.

Mr. WILSON: Counsel for the defendant state, in answer to the objection that has just been made, that Mr. Worthington, who is absent, has been the active counsel in taking the testimony in this case, and counsel at present conducting the examination has no knowledge of any limitation of the scope of the evidence to be taken at this sitting, but did have an understanding with Mr. Worthington before his departure for Europe that the evidence now about to be submitted should be introduced at this session. Any objection to any question as to the propriety of taking this evidence at the present time shall be reserved for future deliberation or determination. Counsel for the defendant now offers in evidence the article in the Electrical Rview of the issue of July 12th, 1899, beginning on page 26, headed "Operation and Maintenance of Telephone Exchanges. Read by E. B. Fisher, before the Independent Telephone Convention at Chicago, June 27th—Discussion," and ending on page 27, omitting the cut entitled "Ridgeway Direct Coupling Engine and Generator."

The said paper is filed herewith, marked "Exhibit Burket Rebuttal No. 1."

2144 Mr. BIRNEY: To which counsel for the complainants object as incompetent for any purpose.

Cross-examination.

By Mr. BIRNEY:

Q. Mr. Burket, do you know who E. B. Fisher is? A. No, sir.

Q. He is named as the author of this paper. Did you ever hear of him? A. No, sir; I have not read the article.

Q. You do not know the man at all? A. No, sir; not by that name.

Q. And of course you do not know what experience, if any, he has ever had in telephone matters? A. No, sir.

Q. Do you know who Mr. Fair is, who appears to have participated in the discussion? A. No, sir; I know nothing about the article or the party.

Q. The discussion seems to have been participated in by Mr. De Lamb, Mr. Critchfield, Mr. Hogue and Mr. Fisher. Do you know any of these men? A. I don't recall them. No, sir; I don't know them.

Q. Have you ever heard of them in electrical affairs? A. I may have heard of them, but not having read the article, I can't connect them with anything in this line.

JOSEPH U. BURKET,
By the Examiner, by Consent.

Subscribed and sworn to before me, this —— day of ——, 1899.

——— ———,
Examiner in Chancery.

2145 WILLIAM H. DELACY, a witness called by and on behalf of the defendant in rebuttal, having been first duly sworn, is examined.

By Mr. WILSON:

Q. Mr. DeLacy, where do you reside? A. I reside at 1812 5th street N. W.

Q. How long have you lived in this city? A. With the exception of temporary absences, I have lived here, Judge, for thirty-six years.

Q. How and where are you employed? A. I am a clerk of the fourth class in the Department of the Interior, in the Secretary's Office, at $1,800 a year. That is the regular salary for that class.

Q. How long have you been employed there? A. I think it is since the 27th of October, 1882. That is about seventeen years next October.

Q. Have you brought with you, in obedience to a subpoena duces tecum, any documents from the Interior Department? A. I have, sir, as far as I have been able to comply with the terms of that subpoena, and the compliance is practically full and perfect.

Q. Have you the originals with you? A. I have, sir. I have the originals of the letters of complaint, to which you no doubt have reference.

Q. The reports that have been made? A. Yes, sir.

Q. Have you certified copies of them? A. I have, sir.

2146 Q. Please produce them. A. These are the certified copies (producing papers).

Mr. WILSON: The reports referred to by the witness are now offered in evidence, and it is consented that the certified copies shall be used in place of the originals.

The said certified copies are appended hereto, marked "Exhibit DeLacy Rebuttal No. 1."

Mr. BIRNEY: Counsel for complainants object, not to the form in which the papers are brought, but because they are not competent for any purpose.

By Mr. WILSON:

Q. How many bureaus of the Interior Department are connected by this system of telephones to which these reports relate? A. Eight bureaus, including the office of the Secretary.

Q. Name what they are. A. There is the office of the Secretary, the Patent Office, the General Land Office, the United States Bureau of Education, the Office of Indian Affairs, the United States Geological Survey, the Pension Office, and the

Office of the Commissioner of Railroads, which is located in the Pension Building.

Q. How many of these bureaus are outside of the Interior Department Building? A. Meaning the Patent Office Building as the Interior Department Building?

Q. Yes. A. All with the exception of three—the Office of the Secretary, the Patent Office, and the General Land Office.

2147 Q. They are in the building? A. They are within our building at present. The Land Office will be moved out.

Q. Where is the Geological Survey Office? A. That is in what is called the Hooe Iron Building, on the south side of F street, between 13th and 14th.

Q. And the Patent Office— A. When you mention the Patent Office, it reminds me that a part of the Patent Office is located in the Union Building. The models were moved out of there to give us additional room in the main building.

Q. You have stated where the Geological Survey is, and where the Pension Building is. A. The Pension Building is well known. It is in Judiciary Park.

Q. Where is the Indian Bureau? A. It is located in the Atlantic Building, on the south side of F street, between 9th and 10th.

Q. What other one is there? A. The United States Bureau of Education is located on the northeast corner of 8th and G streets, in what is known as the Wright Building. The United States Pension Agency is connected with this system through the Pension Office Building. The Pension Agency is at the corner of 4th and F streets, the southeast corner, if I recall it correctly.

Q. How are these different bureaus outside of the Interior Department Building connected? A. They are connected by trunk lines, which are run, I think, mainly across the

2148 roofs of adjacent houses, and in some instances along Government poles along G street.

Q. These connections with the Interior Department are overhead? A. Overhead.

Q. House-top connections? A. House-top and pole connections.

Q. And where are the pole connections? A. I think the only pole connections are between the Patent Office Building, the Union Building, and the Pension Building. That takes in the space between the Patent Office, along G street, taking in the Union Building, continuing down to the Pension Building, which begins at 5th and G.

Q. Where do you say the Union Building is? A. It is on the north side of G, between 6th and 7th. I don't know whether

they use a pole line between that and our building, but it is quite likely they tap a pole. I think they do. I am not certain about it. There is a line of Government poles, though, passing up G street. At least, I have been so told by a man in the office of the Superintendent of Public Buildings and Grounds.

Q. Have you brought anything with you showing what it cost the Government to install that system? A. I have, sir.

Q. What is it? State what the amount is of the cost of installing, and then produce the papers showing it. A. As far as I can make out, $6,740.52. I have copies of two vouchers, reading, respectively, $1,174.56 and $5,565.76.

2149 Q. How many telephones are there? A. There are, I think, 140 telephones on the Interior Department system. I should explain about those vouchers. Under our system, vouchers are always rendered in duplicate for articles that are sold to our department. Each voucher is signed by the party furnishing the goods, but each voucher is not approved by the Secretary, for the obvious reason to prevent duplication of payment. A duplicate voucher is kept in the office of the custodian, for whose office we make purchases from the miscellaneous supply fund. The original is filed with our supply clerk. The originals of those papers are on file in our department. Those vouchers are duplicates of the originals, except that they do not bear the signature of approval by the Secretary or Acting Secretary.

Q. They are retained vouchers? A. Retained vouchers. We have made copies of those vouchers as retained, copies of the retained copies.

Mr. WILSON: The vouchers referred to by the witness are offered in evidence.

Said papers are filed herewith, marked "Exhibit DeLacy Rebuttal, No. 2."

Cross-examination.

By Mr. BIRNEY:

Q. Have you calculated the total cost per telephone of the installation of that system; if so, how much is it? A. I have here this evening. It is about $48 per telephone.

2150 Q. Can you state what employees of the Government are employed in any way in caring for the telephone service? A. Yes; we have a young man by the name of Marean, whose initials I regret I cannot furnish. He is a son of Mr. Morell Marean, and he has a contract with us to care for these telephones at a compensation of $40 a month. In addition to that, I have learned that some of the employees

of the Pension Office are in the habit of making casual repairs in that building. One man gets $1,800 a year. The other man I am not certain about, but I think he gets $1,200 or $1,400 a year. These men, though, are not engaged in this business exclusively. They just help out, as I understand, in that building. It is done without the direction of our office.

Q. What other persons are employed in connection with the system as operators or otherwise? A. We have a telephone operator in the Department telephone room, Miss Nedius, at a salary of $600 a year, if I remember rightly. There is an employee of the Pension Office who is a telegraph and telephone operator. I think his name is Getz. My recollection is that he receives $1,800 a year. He is the one to whom I had reference previously as making repairs from time to time. I have been informed that he does. I don't know that of my own knowledge. I just know it officially.

Q. He is the telegraph operator? A. Telegraph and telephone operator—so I understand. If I could get the Register of the Interior Department, I would be able to tell you more definitely. We have about 4,000 people here in the District of Columbia, and it is hard to keep track of them.

2151 Q. Are there any other operators? A. There is an operator at the Geological Survey. Freeman, I think his name is.

Q. I do not care about his name. A. I don't know his compensation, but I imagine it is not over $900 per year.

Q. Does he do nothing else but attend to the telephone in that office? A. He attends to their electric bells. I think the major portion of his duties, though, is to look after the telephone instruments. I am not positive about that, because my duties do not carry me up there frequently. He is not under my direct control or supervision.

Q. Is he an operator or is he an electrician, who may repair the system? A. I would describe him as a young man who has acquired a knowledge of electricity.

Q. In what way? A. By patient study. I do not know that he is a professional, or that he goes to any of the professional schools, but he takes an interest in electricity and electrical matters. He is one of the men in the department who keeps studying all the time and trying to better themselves.

Q. Are there any other operators? A. There is a little exchange in the Indian Office. I am under the impression, though, that the clerk who manages that exchange is not engaged exclusively on that work. If the clerk is Miss Cook, with whom I have frequently talked over the telephone from the Indian Office, I know she does not do that exclu-

2152 sively, because she is the requisition clerk in the office,

and a sort of general assistant to the Commissioner of Indian Affairs. Her salary is $1,800 a year. That can be ascertained easily by reference to the Register.

Q. Are there any other persons? A. I don't recall anybody else whose business would seem to be largely in connection with the telephones. We have an electrician in the department, who, from time to time, has been called upon to help out in an emergency, but, then, that is merely incidental.

By Mr. WILSON:

Q. What is his salary? A. He gets $1,000 a year, Judge, but he is connected largely with the electric light plant. This is his main business. I don't think he does much in the telephone line.

By Mr. BIRNEY:

Q. Is there any other person than Mr. Marean whose business it is regularly to repair and maintain the telephone system? A. It is Mr. Marean's main business to look after the telephones. Of course, he is not all the time at the department, but he comes when we notify him that his services are needed. The services of these other people are merely incidental to their other duties.

Q. Mr. Marean comes when you notify him? A. Yes, sir.

Q. Mr. DeLacy, can you tell us what amount of material for repairs or for use in connection with the telephone system has been purchased during the last year or any year? A. I am not prepared to answer that question; no, sir. We
2153 have purchased materials, but how much I can't say without looking at the books and finding out.

Q. Have you the materials in your office from which you could get that information? A. We have, in the department, in the custodian's office.

Q. Who is the custodian? A. Hiram Buckingham; or it might be gotten from Mr. Evans' book; but I think Mr. Buckingham could give the data more readily.

Q. Have you any information on that subject? A. None further than that we get material from time to time. I don't notice it, you know. It is too much detail. In fact, I couldn't remember it.

Q. Have you examined to see whether there are any other vouchers given in connection with the installation of that system? A. There were vouchers subsequently given, but for material that was purchased afterward, and that I assumed was not properly connected with the installation charges, which I was told to furnish. It was material that was gotten afterward.

Q. How soon afterward? A. My recollection is that it was some eight, ten or twelve months afterward. Certainly eight months afterward.

Q. Were those the first supplies furnished after the installation? A. I couldn't answer. They were certainly the first supplies of any great magnitude, because the bookkeeper called them to my attention. There may have been minor purchases.

WILLIAM H. DeLACY,
By the Examiner, by Consent.

2154 Subscribed and sworn to before me this —— day of - ———, A. D. 1899.

Examiner in Chancery.

(The further taking of these depositions was thereupon adjourned.)

2155 Washington, D. C., Friday, July 21st, 1899,

10 o'clock a. m.

Met pursuant to agreement at the office of Birney & Woodard, Mertz Building, Washington, D. C.

Present on behalf of the complainants, Mr. BIRNEY.
Present on behalf of the defendant, Mr. WILSON.

WILLIAM DELACY was thereupon recalled on behalf of the defendant, and testified as follows:

By Mr. WILSON:

Q. Who did the construction between the Interior Department and the outside bureaus—the Pension Office, the Geological Survey, the Indian Office, etc.? A. One A. E. Kennedy put the wires up.

Q. And who paid for it? A. The Interior Department paid for it. That was an additional charge to the cost of the plant, which amounts to $322.50 in toto. There are three separate vouchers.

Q. Have you certified copies of those vouchers? A. I have, sir. These (producing papers) are certified copies, duly certified by the Acting Secretary of the Interior, under the seal of the Department.

Q. Have you the originals of those vouchers with you? A. I have the retained duplicates of our office, which are the same of the originals, except that they are not approved by the head of the Department.

2156 Q. They are retained copies? A. These are our re-

tained vouchers. They are signed, too, by Mr. Kennedy —at least, one of them is.

Q. Those are the vouchers that you retained in your due course of business? A. In the due course of business, in the office of the Custodian of the Interior Department.

Cross-examination.

By Mr. BIRNEY:

Q. Was this Mr. Kennedy connected in any way with the Western Construction Company, to your knowledge? A. Not to my knowledge, Mr. Birney.

Q. Is it not the fact that his work was done quite independent of the Western Construction Company? A. It was independent; but it was necessary to connect the switchboard with the outside offices. We had to have outside wires. These are the wires that I spoke of the other night as being house-to-house-top connections, and I was not quite certain whether they used Government poles on G street or not. I am not certain yet; I do not know about that; but I suppose it is not necessary for me to look into that point.

Mr. WILSON: No.

The WITNESS: But they connect the Pension Building, the Pension Agency at Fourth and F, Mr. Wilson's office, the Geological Survey, the Indian Office, and the Bureau of Education, with the Patent Office Building—these overhead wires.

2157 By Mr. BIRNEY:

Q. And they are the wires which were put up by Mr. Kennedy? A. By Mr. Kennedy or by his force, of course.

Q. Under employment by the Interior Department? A. Yes, sir.

WILLIAM DELACEY,
By the Examiner, by Consent.

Subscribed and sworn to before me, this —— day of ———, A. D. 1899.

———— ————,
Examiner in Chancery.

(The paper produced by the witness, consisting of certified copies of three vouchers, is offered in evidence by counsel for the defendant, and the same is filed herewith, marked "Exhibit DeLacy Rebuttal No. 3.")

(Counsel for the defendant thereupon announced his testimony closed.)

2158 Supreme Court of the District of Columbia.

UNITED STATES OF AMERICA, *District of Columbia*, } ss:

I, John R. Young, Clerk of the Supreme Court of the District of Columbia, hereby certify the foregoing pages, numbered from 1 to 176, inclusive, containing pleadings and exhibits, and three volumes designated "I," "II" and "III," containing testimony, paged from 1 to 1969, inclusive, to be a true and correct transcript of the record, as per stipulations of counsel filed herein, copies of which are made part hereof, in cause No. 19,358, Equity, wherein J. Forrest Manning & Co. is complainant and The Chesapeake and Potomac Telephone Company is defendant, as the same remains upon the files and of record in said court.

Seal Supreme Court of the District of Columbia.

In testimony whereof I hereunto subscribe my name and affix the seal of said court, at the city of Washington, in said District, this 14th day of May, A. D. 1900.

JOHN R. YOUNG, *Clerk*.

Endorsed on cover: District of Columbia Supreme Court. No. 1003. J. Forrest Manning & Co., appellants, vs. The Chesapeake and Potomac Telephone Co. Court of Appeals, District of Columbia. Filed June 12, 1900. Robert Willett, Clerk.

1161 *Addition to Record per Stipulation of Counsel.*

Court of Appeals, District of Columbia, October Term, 1900.

J. FORREST MANNING and HARRY E. RUPPRECHT, Trading as J. Forrest Manning & Co., Appellants,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY. } No. 1003.

Filed October 20, 1900.

In the Court of Appeals of the District of Columbia, October Term, 1900.

J. FORREST MANNING and HARRY E. RUPPRECHT, Trading as J. F. Manning & Co., Appellants,
vs.
CHESAPEAKE AND POTOMAC TELEPHONE COMPANY. } No. 1003.

It appearing upon inspection of the printed record filed in this cause that through inadvertence the four exhibits, A, B, C, and D produced in evidence in connection with the testimony of Charles A. Haskins at page 343 of the printed record were omitted from the transcript, it is this 19th day of October, 1900, stipulated and agreed that the said exhibits as hereto attached may be separately printed and taken and used as a part of the record in this cause.

A. A. BIRNEY,
Of Counsel for Complainant.
A. S. WORTHINGTON,
Of Counsel for Defendant.

EXHIBIT A.

THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY—WASHINGTON PLANT.

Statement of Earnings and Expenses for the Six Years Ended December 31, 1897.

	For year ended December 31—						Total for six years.	Average per annum.
	1892.	1893.	1894.	1895.	1896.	1897.		
EARNINGS.								
Rentals from exchange subscriptions	$164,778.32	$176,895.55	$176,835.84	$178,772.67	$177,540.27	$178,254.78	$1,053,077.43	$175,512.90
Receipts from local pay stations				296 50	843.94	9,946.97	11,087.41	1,847.90
Commission on long-distance business	1,353.69	140.68	692.94	173.36	374.40	679.32	3,414.39	569.07
Commissions on messages collected for the Western Union Telegraph Co.	46.20	47.65	34.75	48.80	46.68	69.23	293.51	48.92
Receipts from toll service				106.20	288.05	836.80	1,231.05	205.17
Extraterritorial revenue	1,562.82	4,012.00	5,095.10	6,487.37	6,942.51	7,907.98	31,977.78	5,329.63
Private line rentals	8,525.86	10,428.73	7,544.37	5,394.62	5,149.89	5,857.95	42,811.42	7,135.24
Messenger service				14.35	11.10	16.35	41.80	6.97
Real estate	214.50			300.00	365.00	35 00	914.50	152.42
Commissions on messages distributed for the Western Union Telegraph Company					12.70	22.57	35.27	5.88
Loop rentals, care batteries, etc., for the American Telephone and Telegraph Company	492.16	499.10	596.67	611.48	921.76	1,029.56	4,150.73	691.79
Rental of attachments on poles and underground conduits					278.98	122.63	401.61	66.93
Moving telephones	1,065.30	1,716.92	1,175.10	707.95	732.71	624.84	6,022.82	1,003.80
Profit on labor and material sold	650.53	517.31	344.83	1,296.27	562.13	1,013.66	4,384.73	730.79
Total gross earnings	178,689.38	194,257.94	192,289.60	194,119.57	194,070.32	206,417.64	1,159,844.45	193,307.41
EXPENSES.								
Maintenance:								
Salaries and wages	16,495.03	15,513.33	20,787 82	22,031.63	28,231.48	47,454.18	150,513.47	25,085.58
Rent, light, and heat	879.19	786.89	1,298.83	1,356.33	1,367.07	1,580.02	7,208.33	1,201.39
Material	14,013.88	18,217.97	25,131.77	12,473.50	19,100.08	53,710.79	142,647.79	23,774.63
Traveling	1,192.08	1,152.21	1,521.69	1,376.69	1,999.90	1,876.93	9,119.41	1,519.90
Conduit, pole, and roof rent	213.50	181.00	198.66	172.39	273.17	437.14	1,071.08	178.51
Insurance	143.75	146.50	293.50	205.00	208.00	307.50	1,304.25	217.37
Damage and compensation	208.53	48.10	143.25	115.85	313.48	216.38	1,045.59	174.27
Incidental	4,063.02	1,347.71	1,839.51	1,413.86	455.67	563.66	9,683.43	1,613.91
Total maintenance expenses	37,208.98	37,393.71	51,094.94	38,800.27	51,948.85	106,146.60	322,593.35	53,765.56
Operating:								
Salaries and wages	13,035.59	13,814.61	13,723.79	13,490.60	12,952.34	14,215.35	81,232.28	13,538.71
Rent, light, and heat	2,143.63	2,000.26	2,199.45	2,254.58	2,127.42	2,314.92	13,040.26	2,173.38
Incidental	605 35	697.21	739.28	511.91	355.74	519.55	3,429.04	571.60
Total operating expenses	15,784.57	16,512.08	16,662.52	16,257.09	15,435.50	17,049.82	97,701.58	16,283.69

EXHIBIT A—Continued.

THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY—WASHINGTON PLANT—Continued.

Statement of Earnings and Expenses for the Six Years Ended December 31, 1897—Continued.

	For year ended December 31—						Total for six years.	Average per annum.
	1892.	1893.	1894.	1895.	1896.	1897.		
EXPENSES—Continued.								
General:								
Salaries and wages	$12,209.87	$13,106.06	$14,166.58	$11,443.62	$10,953.74	$11,707.09	$73,586.96	$12,264.49
Rent, light, and heat	1,021.43	885.70	1,216.99	885.70	768.42	855.15	5,608.39	933.90
Real estate	90.30	101.22	770.73	168.20	122.13	147.77	1,400.35	233.39
Traveling	2,555.00	1,711.97	1,641.23	1,196.20	1,372.11	1,363.94	9,840.45	1,640.08
Postage, printing, and stationery	1,043.16	1,151.82	1,718.05	2,045.40	2,244.01	2,386.32	10,588.56	1,764.76
Legal	538.10	974.48	2,096.37	1,099.14	2,285.51	9,072.17	16,065.77	2,677.63
Incidental	700.85	846.89	1,787.25	1,951.99	955.75	1,954.54	8,197.27	1,366.21
Total general expenses	18,158.71	18,777.94	23,397.20	18,760.25	18,701.67	27,486.98	125,282.75	20,880.46
Rentals and royalties:								
Instrument rental, American Bell Telephone Co.	21,066.81	22,192.19	16,271.74	12,051.74	12,092.07	12,775.71	96,350.26	16,058.38
Instrument rental, private line, American Bell Telephone Co.	3,809.07	3,902.42	1,666.64	1,213.35	1,054.38	1,084.74	12,730.60	2,121.77
Royalty on extraterritorial business, American Bell Telephone Co.	281.28	243.77	692.94	818.57	902.43	1,038.02	3,977.01	662.83
Royalty on messages handled for the Western Union Telegraph Co.	64.57	56.33	15.92	24.53	23.45	34.61	219.41	36.57
Royalty on switchboard	1,518.08	1,626.75	1,609.83	1,710.66	1,672.67	1,717.17	9,855.16	1,642.53
14.93 per cent. of total gross earnings	26,679.81							
14.42 per cent. of total gross earnings		28,021.46						
10.51 per cent. of total gross earnings			20,217.07					
8.15 per cent. of total gross earnings				15,818.85				
8.11 per cent. of total gross earnings					15,745.00			
8.06 per cent. of total gross earnings						16,650 25		
10.61 per cent. of total gross earnings							123,132.44	
Do.								20,522.08
Total expenses	97,832.07	100,705.19	111,371.73	89,636.46	101,831.02	167,333.65	668,710.12	111,451.69
Taxes	300.00	225.00	300.00	300.00	304.16	330.55	1,759.71	293.28
Total expenses and taxes	98,132.07	100,930.19	111,671.73	89,936.46	102,135.18	167,664.20	670,469.83	111,744.97
Net earnings	80,557.31	93,327.75	80,617.87	104,183.11	91,935.14	38,753.44	489,374.62	81,562.44
Per cent. of expenses and taxes to total gross earnings	54.92	51.96	58.07	46.33	52.63	81.23	57.81	57.81

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EXHIBIT B.

Statement of Income Account for the Six Years Ended December 31, 1897.

	For year ended December 31—						Total for six years.	Average per annum.
	1892.	1893.	1894.	1895.	1896.	1897.		
RECEIPTS.								
Net earnings, as per Exhibit A	$80,557.51	$93,327.75	$80,617.87	$104,183.11	$91,935.14	$38,753.44	$489,374.62	$81,562.44
DISBURSEMENTS.								
Bad accounts charged off					2,596.96	1,108.77	3,705.73	617.62
Miscellaneous interest, Washington proportion figured on revenue basis	10.74	2,237.67	1,374.16	2,166.29	1,062.20	1,476.52	8,306.10	1,384.35
Interest on first-mortgage bonds, Washington proportion two-fifths of total charge	8,000.00	8,000.00	8,000.00	8,000.00	8,000.00	8,027.30	48,027.30	8,004.55
Sinking fund, Washington proportion two-fifths of the total charge		8,000.00	8,000.00	8,000.00	8,000.00	8,000.00	40,000.00	6,666.67
Total	7,969.26	18,237.67	17,374.16	18,166.29	19,659.16	18,612.59	100,039.13	16,673.19
Surplus from operations	72,568.05	75,090.08	63,243.71	86,016.82	72,275.98	20,140.85	389,335.49	64,889.25

EXHIBIT C.

Statement of Profit and Loss Account for the Six Years Ended December 31, 1897.

	For year ended December 31—						Total for six years.	Average per annum.
	1892.	1893.	1894.	1895.	1896.	1897.		
RECEIPTS.								
Surplus from operations, as per Exhibit B	$72,568 05	$75,090.08	$63,243 71	$86,016.82	$72,275.98	$20,140.85	$389,335 49	$64,889.25
Collections made for rent of wire, etc., account of the year 1891	439.38						439.38	73.23
Toll tickets sold from 1885 to 1892 and not used, Washington proportion					55.74		55.74	9.29
Premium on bonds sold, $100,000 at 3 per cent., $3,000; Washington proportion, two-fifths						1,200.00	1,200.00	200.00
Total	73,007.43	75,090.08	63,243.71	86,016.82	72,331.72	21,340.85	391,029.61	65,171.77
CHARGES.								
Commission paid for selling $85,000 of bonds, 1 per cent., $850; Washington proportion, two-fifths						340.00	340.00	56.67
Depreciation charged off			24,597.33	20,251.20	9,012.75		53,861.28	8,976.88
Total			24,597.33	20,251.20	9,012.75	340.00	54,201.28	9,033.55
Balance	73,007.43	75,090.08	38,646.38	65,765.62	63,318.97	21,000.85	336,829.33	56,138.22
Dividends paid on capital stock:								
2½ per cent. on $750,000	18,750.00							
2 per cent. on $750,000		15,000.00						
2 per cent. on $750,000			15,000.00					
2 per cent. on $750,000				15,000.00				
3 per cent. on $750,000					22,500.00			
4 per cent. on $750,000						30,000.00		
15.5 per cent. on $750,000							116,250 00	
2.583 per cent. on $750,000								19,375.00
Surplus for year	54,257.43	60,090.08	23,646.38	50,765.62	40,818.97	9,999.15	220,579.33	36,763.22
Deficit for year								

EXHIBIT D.

Statement of Earnings and Expenses, per Telephone, for the Six Years Ended December 31, 1897.

	For year ended December 31—						Total for six years.	Average per annum.
	1892.	1893.	1894.	1895.	1896.	1897.		
Average number of telephones in use	1,751	1,822	1,818	1,742	1,879	1,929	10,941	1,823.5
Rental from exchange subscriptions	164,778.32	176,895.55	176,835.84	178,772.67	177,540.27	178,254.78	$1,053,077.43	$175,512.90
Receipts from local stations				296.50	843.94	9,946.97	11,087.41	1,847.90
Total exchange station income	164,778.32	176,895.55	176,835.84	179,069.17	178,384.21	188,201.75	1,064,164.84	177,360.80
Private line rentals	8,525.86	10,428.73	7,544.37	5,304.62	5,149.89	5,857.95	42,811.42	7,135.24
Extraterritorial and miscellaneous revenue	4,734.67	6,416.35	7,564.56	8,449 51	9,974.09	11,344.28	48,483.46	8,080.58
Profit on labor and material sold	650.53	517.31	344.83	1,296.27	562.13	1,013.66	4,384.73	730.79
Total receipts, as per Exhibit A	178,689.38	194,257.94	192,289.60	194,119.57	194,070.32	206,417.64	1,159,884.45	193,307.41
Average per telephone	102.05	106.62	105.77	111.43	103.28	107.01	106.01	106.01
Expenses and taxes, as per Exhibit A	98,132.07	100,930.19	111,671.73	89,936 46	102,135.18	167,664.20	670,469.83	111,744.97
Income account expenses, as per Exhibit B	7,989.26	18,237.67	17,374.16	18,166.29	19,659.16	18,612.59	100,039.13	16,673.19
Total expenses	106,121.33	119,167.86	129,045.89	108,102.75	121,794.34	186,276.79	770,508.96	128,418.16
Average per telephone	60.61	65.40	70.98	62.08	64.82	96.57	70.42	70.42
Total net income from all business	72,568.05	75,090.08	63,243.71	86,016.82	72,275.98	20,140.85	389,335.49	64,889.25
Average per telephone	41.44	41.22	34.79	49.37	38.46	10.44	35.59	35.59
Total receipts from exchange stations, as per above	164,778.32	176,895.55	176,835.84	179,069.17	178,384.21	188,201.75	1,064,164.84	177,360.80
Average per telephone	94.11	97.09	97.27	102.80	94.94	97.56	97.26	97.26
Total expenses as per above	106,121.33	119,167.86	129,045.89	108,102.75	121,794.34	186,276.79	770,508.96	128,418.16
Less items not relating to exchange service :								
Private line expenses, rentals, and royalties	4,032.38	4,047.50	1,890.03	1,637.01	1,315.64	1,201.94	14,124.50	2,354.08
Royalty on extraterritorial business	281.28	243.77	692.94	818.57	902.43	1,038.02	3,977.01	662.84
Royalty on messages handled for the Western Union Telegraph Co.	64.57	56.33	15.92	24.53	23.45	34.61	219.41	36.57
Proportion of expenses applicable to extraterritorial and miscellaneous revenue (being the general percentage of expenses to earnings, not including rentals and royalties) :								
39.99 per cent. of $4,734.67	1,893.39							
37.54 per cent. of $6,416.35		2,408.70						
47.56 per cent. of $7,564.56			3,597.70					
36.18 per cent of $8,449.51				3,226.02				

EXHIBIT D—Continued.

Statement of Earnings and Expenses, per Telephone, for the Six Years Ended December 31, 1897—Continued.

	For year ended December 31.						Total for six years.	Average per annum.
	1892.	1893.	1894.	1895.	1896.	1897.		
Less items not relating to exchange service—Continued.								
Proportion of expenses applicable to extraterritorial and miscellaneous revenue (being the general percentage of expenses to earnings not including rentals and royalties)—Continued.								
44.51 per cent. of $9,974.09					$4,439.47			
73.16 per cent. of $11,344.28						$8,299.48		
49.22 per cent. of $48,483.46 and $8,080.58							$23,864.76	$3,977.46
Total deductions—expenses not applicable to exchange stations	$6,271.62	$6,756.30	$6,196.59	$5,706.13	6,680.99	10,574.05	42,185.68	70,030.95
Total expenses—exchange stations	99,849.71	112,411.56	122,849.30	102,396.62	115,113.35	175,702.74	728,323.28	121,387.21
Average per telephone	57.92	61.70	67.57	58.78	61 26	91.09	66.57	66.57
Net earnings, exchange stations	64,928.61	64,483.99	53,986.54	76,672 55	63,270.86	12,499.01	335,841.56	55,973.59
Average per telephone	37.09	35.39	29.70	44.02	33.68	6.47	30.69	30.69

1168 Endorsed on cover: District of Columbia supreme court. No. 1003. J. Forrest Manning & Co., appellants, *vs.* The Chesapeake and Potomac Telephone Co. Court of Appeals, District of Columbia. Filed Oct. 20, 1900. Robert Willett, clerk.

1169 *Second Addition to Record.*

In the Court of Appeals of the District of Columbia, October Term, 1900.

J. FORREST MANNING and HARRY E. RUPPRECHT, Trading as J. F. Manning & Co., Appellants,
vs.
CHESAPEAKE AND POTOMAC TELEPHONE COMPANY, Appellee.
} No. 1003.

It appearing that a table prepared by the witness Haskins, headed "Miscellaneous Statements," has been omitted from the printed record and from the transcript,

It is this 8th day of December, 1900, stipulated and agreed that the said table may be separately printed and used as a part of the record in this case.

A. S. WORTHINGTON,
Of Counsel for Appellee.
JNO. J. HEMPHILL,
Of Counsel for Appellant.

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	For year ended December 31—						Total for six years.	Average per annum.
	1892.	1893.	1894.	1895.	1896.	1897.		
TELEPHONE RENTAL.								
Average number of telephones in use	1,751	1,822	1,818	1,742	1,879	1,929	10,941	1,823.5
Instrument rental, American Bell Telephone Co	$21,006.81	$22,192.19	$16,231.74	$12,051.74	$12,092.07	$12,775.71	$96,350.26	$16,058.38
Average per telephone	12.00	12.18	8.93	6.92	6.43	6.62	8.81	8.81
PRIVATE LINE.								
Average number of telephones in use	337	340	340	356	393	432	2,198	366⅓
Instrument rental, American Bell Telephone Co	$3,809.07	$3,902.42	$1,666.64	$1,213.35	$1,054.38	$1,084.74	$12,730.60	$2,121.77
Average per telephone	11.30	11.48	4.90	3.41	2.68	2.51	5.79	5.79
Maintenance items:								
Salaries and wages	16,495.03	15,513.33	20,787.82	22,031.63	28,231.48	47,454.18	150,513.47	25,085.58
Material	14,013.88	18,217.97	25,131.77	12,473.30	19,100.08	53,710.79	142,647.79	23,774.63
Traveling	1,192.08	1,152.21	1,521.60	1,376.69	1,999.90	1,876.93	9,119.41	1,519.90
Total	31,700.99	34,883.51	47,441.19	35,881.62	49,331.46	103,041.90	302,280.67	50,380.11
Average per telephone	18.10	19.15	26.10	20.60	26.25	53.42	27.63	27.63
Sinking fund	....	8,000.00	8,000.00	8,000.00	8,000.00	8,000.00	40,000.00	6,666.67
Average per telephone	....	4.39	4.40	4.60	4.26	4.15	3.66	3.66

1171 TUESDAY, *March 19th, A. D.* 1901.

J. FORREST MANNING and HARRY E. RUPPRECHT, Trading as J. Forrest Manning & Co., Appellants,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY. } No. 1003.

Counsel on each side allowed two hours' additional time in the argument of this case. The argument in the above-entitled cause was commenced by Mr. John J. Hemphill, attorney for the appellants, and was continued by Mr. J. M. Wilson, attorney for the appellee.

WEDNESDAY, *March 20th, A. D.* 1901.

J. FORREST MANNING and HARRY E. RUPPRECHT, Trading as J. Forrest Manning & Co., Appellants,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY. } No. 1003.

The argument in the above-entitled cause was continued by Mr. A. S. Worthington, attorney for the appellee, and by Mr. A. A. Birney, attorney for the appellants. On motion the appellee is allowed three days in which to file reply briefs herein.

1172 THURSDAY, *March 21st, A. D.* 1901.

J. FORREST MANNING and HARRY E. RUPPRECHT, Trading as J. Forrest Manning & Co., Appellants,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY. } No. 1003.

The argument in the above-entitled cause was concluded by Mr. A. A. Birney, attorney for the appellants.

1173 J. FORREST MANNING and HARRY E. RUPPRECHT, Trading as J. Forrest Manning & Co., Appellants,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY. } No. 1003.

Opinion.

Mr. Justice SHEPARD delivered the opinion of the court:

This suit was begun by the appellants in the supreme court of the District of Columbia to compel the Chesapeake and Potomac Telephone Company to continue to furnish them the ordinary service of the Washington telephone exchange upon payment of the annual rate prescribed in the act of Congress of June 30, 1898. This regulation of rates is contained in a proviso added to an item of the general appropriation bill of that date, and reads as follows:

"Provided, That from and after the passage of this act it shall be

unlawful for any person or any telephone company doing
1174 business in the District of Columbia to charge or receive more than $50 per annum for the use of a telephone, on a separate wire; $40 for each telephone, there being not more than two on a wire; $30 for each telephone, there being not more than three on a wire, and $25 for each telephone, there being four or more on the same wire." 30 Stat. 537, 538.

The Chesapeake and Potomace Telephone Company, then, as now, owned and operated the only telephone plant in the District of Columbia.

On July 1, 1897, plaintiffs entered into a contract with the defendant, whereby the latter agreed to furnish them its improved appliances, with special metallic circuit, for use in their business offices, and for which they promised to pay the sum of $125 per annum, quarterly, in advance, and $10 additional per annum for an extra desk cabinet equipment. By special provision the contract was declared to continue from year to year, subject to termination by either party, after the first year, upon ten days' notice.

Upon the passage of the aforesaid act plaintiffs gave notice of termination of the contract, and then, ten days later, notified defendant that they would retain the telephone equipment at the rate of $50 per annum, as provided by law. They also tendered payment in advance at said rate. Defendant declined to accept payment at said rate on the ground that the same was less than the cost of service, but offered to continue at the former contract rate, or else to remove its telephone equipment from plaintiffs' office and discontinue their service. Alleging these facts, and renewing the tender of payment of the statutory rate, plaintiffs' bill prayed that defendant be enjoined from removing their telephone appliances, and from refusing or neglecting, when requested, to furnish them the usual telephone connections and service.

The defendant's answer averred that its service could not be maintained at the rate fixed by the act of Congress without actual loss, and denied the power of Congress to compel it to furnish the same for less than cost, because the effect would be the confiscation of its property. The temporary injunction prayed for was granted August 4, 1898. About fifty like suits were filed by other subscribers. These were practically consolidated with this suit, in which alone testimony has been taken, and made to abide its result.

A great volume of testimony was taken by the parties, and the cause came on to be heard February 5, 1900. The result was a final decree dismissing the bill, from which this appeal has been duly prosecuted.

The first public use of the telephone in the city of Washington was begun by Geo. C. Maynard late in the year 1878, under a contract with Gardiner G. Hubbard, trustee, for the agency and use therein of the inventions of Alexander Graham Bell. Maynard was made exclusive agent for the rental of the Bell telephones and call bells, which were to be supplied to him. He was to erect lines, use diligence to bring the telephones into use and for compensation to receive a percentage of the rentals of instruments. A subsequent

agreement ratifying the foregoing and extending it to certain other inventions controlled by the Western Union Telegraph Company was made with Maynard by the National Bell Telephone Company, which had in the meantime become the assignee of the Bell patents and others. About December 1, 1879, Maynard conveyed his plant, rights, etc., to the National Capital Telephone Company, a corporation created under the laws of West Virginia.

March 31, 1883, this company entered into a contract with the American Bell Telephone Company for the use of its telephones upon an agreed division of the proceeds of their rentals to subscribers.

Shortly after this the Chesapeake and Potomac Telephone Company was incorporated by the laws of the State of New York for the purpose of acquiring the property and consolidating the business of the National Capital Telephone Company, operating in the District, and of the Telephone Exchange Company, a corporation of West Virginia, then operating in Maryland. The capital stock of the Chesapeake and Potomac Telephone Company was fixed at $2,650,000.

On July 30, 1883, the National Capital Telephone Company, in consideration of $750,000 of the capital stock of the Chesapeake and Potomac Telephone Company, transferred to the latter all of its plant, property and rights of every description.

At the same time the Chesapeake and Potomac Telephone Company acquired all the rights, property, etc., of the Telephone Exchange Company in Maryland. The consideration was the delivery of $1,900,000 of the capital stock of the assignee. By the terms of the agreement of transfer $630,000 of this stock was to be delivered to the National Bell Telephone Company and $1,270,000 to the Telephone Exchange Company. Of this last, $100,000 was to be passed to trustees for the use of the Chesapeake and Potomac Telephone Company, and subsequently $62,600 thereof was assigned to the National Bell Company aforesaid and $37,400 sold in the market for the sum of $24,546.67.

The actual value of the visible property received by the Chesapeake and Potomac Telephone Company under these conveyances was the following: From the National Capital Telephone Company, cash, bills receivable and supplies, $77,334.93; plant valued at $91,130.21. Total, $168,465.14.

From the Telephone Exchange Company, cash, bills receivable and supplies, $45,045.24. Plant valued at $300,000. Total $345,045.24.

The difference between the face value of the stock—$750,000—delivered to the National Capital Company and the actual value of the property received—$168,465.14—is represented solely by the valuation of the franchises of the latter company at $581,534.60.

The difference between the face value of the stock—$1,900,000—delivered to the Telephone Exchange Company and the actual value of the property received therefrom—$345,045.24—is represented solely by the franchises of the latter company, estimated, $1,554,954.76.

The Chesapeake and Potomac Telephone Company, after taking over the property and franchises of the other corporations, be-
1175 gan to carry on the business in the District of Columbia, throughout Maryland and a small part of West Virginia. In conducting this business it has charged 40 per cent. of its general office expenses against the plant operated in the District, where its general office is kept. Since 1891 it has issued and sold $500,000 of 6 per cent. bonds, two-fifths of which are also charged against the District plant.

Congress has passed no act incorporating the defendant, or giving it license to carry on its business in the District of Columbia.

The only recognition that it claims is to be found in certain items and clauses of appropriation bills, beginning with that of July, 1888. In that act it was provided, after an appropriation for telephone service, that the Commissioners of the District might authorize the wires of any "existing telegraph, telephone or electric light company now operating in the District of Columbia," to be laid under the streets, alleys, etc., "whenever in their judgment the public interest may require the exercise of such authority—such privileges as may be granted hereunder to be revocable at the will of Congress without compensation." 25 Stat. 323, 324.

An item continuing this authority for another term of Congress under the same condition was contained in the act of March 2, 1889. *Idem*, 804.

The act of August 7, 1894, authorized the erection and use of telephone poles in the public alleys, but the privilege was made subject to revocation at the will of Congress without compensation. 28 Stat. 256.

The act of March 3, 1897, provided that hereafter no wire shall be strung on any alley pole at a height of less than fifty feet from the ground at the point of attachment to said pole; and it was declared that nothing herein contained shall authorize the erection of any additional pole upon any street, avenue or reservation.

The usual condition of revocation at will without compensation was again added. 29 Stat. 678.

Appropriation bills subsequent to that containing the clause regulating charges merely appropriate money to pay defendant's accounts for services rendered. 30 Stat. 117; *idem*, 126.

1. No objection was taken to the bill in the court below for want of jurisdiction, and all the suits depending upon this, save one, were brought upon the assumption that the appropriate remedy was through appeal to the restraining power of a court of equity. It seems that one party, similarly situated, did file a petition for a writ of mandamus, which was denied.

It is true that the learned justice who presided at the hearing of this cause expressed the opinion that the proper remedy was by mandamus, but he did not dismiss the bill on that ground. He proceeded to consider the case on its merits, and dissolved the injunction and dismissed the bill because he found the rates imposed by the statute to be unreasonably and oppressively low.

Notwithstanding that expression of opinion, the appellee has de-

clined to raise the question of jurisdiction on this appeal by suggestion even, and has confined itself to the main question. The case has been depending since July 14, 1898, and the parties have incurred great expense in taking a mass of testimony that covers about 1,100 pages of the printed record.

Taking all of this into consideration, as well as the technical character and limited scope of the action of mandamus, we are not inclined to raise the question of jurisdiction of our own motion, notwithstanding we might find, upon consideration, that there is an adequate and complete remedy at law for the right sought to be enforced.

2. In respect of the nature of its use there would seem to be no ground for distinction between the business of a telephone exchange and that of a telegraph or transportation company. It likewise serves and promotes the public interest, and, moreover, occupies and makes use of the public streets and highways by the express or implied permission of the State.

The regulation of callings affected with a public interest, including charges for services rendered, is an undoubted function of the legislative department, and the courts have no right to inquire into the amount of information possessed by the legislative department or to pass judgment upon the motives that may have prompted the exercise of its powers. Consequently we must pass by as irrelevant the argument on behalf of the appellee, founded on the journals of Congress and proceedings of committees of investigation, to the effect that the regulation in question was hastily adopted as a "rider" upon a general appropriation bill, without notice to or hearing of the defendant, without knowledge of the conditions of its service and in disregard of its interests and rights.

The exercise of the power of regulation was not dependent upon notice and hearing, and we are bound to presume that Congress acted with due knowledge and fair consideration of all the facts and circumstances of the situation which it undertook to affect.

3. On the other hand, it is equally well settled that, whilst the legislative power is inherent and its exercise a matter of wide discretion in respect of the regulation of the conduct and charges of a business affected with a public interest, the one is not paramount and exclusive, and the other is not so conclusive as to preclude judicial inquiry into the effect of a given regulation upon the substantial rights of property of the persons affected.

The courts will make this inquiry and will forbid enforcement when it plainly appears that the regulation violates a binding contract, or is tantamount to the deprivation of property without due process of law, or to its taking for public use without just compensation. San Diego Land Company *v.* National City, 174 U. S. 739, 754, and cases cited.

4. It is unnecessary to consider whether Congress, in the exercise of its plenary power as the sole legislative authority in and for the District of Columbia, is under limitation in respect of power to impair the obligation of contracts in the sense that the same is denied to the States by express provision of the Constitution. No such

question is presented by the record. The defendant holds its franchise as a corporation by grant of the legislature of the State of New York.

Thus incorporated, it came to the District of Columbia and
1176 commenced a business of a public nature without invitation or express permission.

Congress entered into no contract with defendant after its entry and has conferred no franchise upon it; nor has it attempted to annul or curtail the corporate franchise held under the authority of the State of New York.

No implied contract, having legal obligation, can possibly arise out of defendant's entry and commencement of business without obstruction or apparent objection. The United States are under no estoppel. We have seen, in the provisions of statutes heretofore quoted, that each time the Commissioners of the District have been authorized to permit the laying of conduits in the streets and the erection of poles in public alleys it has been with the express reservation of the right of revocation "at the will of Congress and without compensation."

Even if the defendant had been incorporated by act of Congress and specially granted the right to carry on business in the District of Columbia, it would, probably, without a reservation similar to the foregoing, and certainly with it, be subject to repeal or revocation at will. In such event all that would remain to the representatives of the corporation would be the right to take away its cables, poles and other movable property for utilization elsewhere or in some other way. And Congress might also get a franchise to some other corporation with the right to take and use the cables and poles of the defendant, provided that provision be made at the same time for the regular ascertainment and prompt payment of just compensation for the property taken. Greenwood *v.* Freight Company, 105 U. S. 13; Thornton *v.* Marginal Freight Company, 123 Mass. 32.

5. Being a foreign corporation doing business in the District of Columbia upon sufferance—a mere occupant at will, without the protection of contract or vested right—the defendant could be either expelled or permitted to remain upon any conditions whatever, at the will or pleasure of Congress. Power in this respect is, at the least, coextensive with that established beyond all question as belonging to the legislatures of the States. Paul *v.* Virginia, 8 Wall. 168; Waters-Pierce Oil Company *v.* Texas, 177 U. S. 28.

Congress has not exercised this undoubted power of expulsion in the case of the defendant or commanded it, by name, to perform its accustomed services at the fixed rate as the condition of its remaining and doing business in the District. The regulatory act is general in its terms and applies to "any person or any telephone company doing business in the District," but the defendant is the only person, or company so engaged, and, for the time being at least, the regulation can only have application to it. The substantial effect of the act is to impose the statutory rate as the condition of further toleration. The act is mandatory and the intent of Con-

gress is practically the same as if it had said to the defendant: "Accept this rate or withdraw from the District." Congress could not, and did not, undertake to compel the defendant to remain in occupation of the field of operations and carry on business at the imposed rate against its will.

If the defendant, convinced that the rate fixed by law is ruinously low, had suspended its business and abandoned all operations within the District, Congress would have no power over it other than to compel it to remove its obstructions from the streets and other public places. Nor would the courts, in such event, have any power to compel the defendant to give its services to any person. But the defendant cannot remain and carry on its former business in defiance of the law. Persisting in its business, it must be regarded by the courts as accepting the condition and coming under obligation to perform its services at the statutory rate. So persisting and at the same time refusing obedience, it is within the judicial power to compel defendant to observe the rate fixed by Congress until such time in the future as it may voluntarily withdraw from business or Congress may relieve.

According to this view of the defendant's rights and obligations, the preliminary injunction was properly granted, and should have been perpetuated upon final hearing, with the limitation before suggested.

6. It has been further contended on behalf of the appellee that the act of Congress is unconstitutional, because it impairs the obligation of contracts entered into by the defendant with other persons. If the act of Congress undertook to annul or destroy contracts in the nature of grants of private property or vested interests, the power might well be denied, not by virtue of any express prohibition of power to impair the obligation of contracts, but because such an act might be regarded as the usurpation of judicial power, as well as the deprivation of property without due process of law, or taking the same without provision for just compensation. No such contracts are in question here. All other contracts of the defendant, relating to loans, supplies, royalties and services, are incidents of corporate existence and franchises. All persons contracting with a corporation in these particulars do so subject to the dissolution of corporate existence or the termination of special franchises by limitation, by judicial decree or by repeal where that power exists. Mumma *v.* Potomac Co., 8 Pet. 281, 287.

All that remains of such contract obligations is the right in equity to their enforcement, when practicable, against the available property of the corporation in the act of winding up its affairs.

7. What we have before said respecting the power of Congress to prescribe an arbitrary service rate as the condition of defendant's right to do business in the District has been upon the assumption, as charged in the answer, that the rate is ruinously low, that is to say, wholly insufficient to meet the necessary and legitimate expenses of the services to be performed.

Due respect to the legislative department, whose action is assailed, and perfect harmony with the principles upon which the right of

judicial inquiry and interference in such instances is founded, require that one invoking judicial relief shall show beyond reasonable doubt that the enforcement of the regulation will be destructive of property. San Diego Land Co. *v.* National City, 174 U. S. 739, 754, and cases cited.

1177 Moreover, the facts from which the conclusion is to be deduced are complex and peculiarly within the knowledge of the party complaining. If statements and calculations of cost, expenditure and so forth are misleading or untrue, they often cannot be contradicted, and if uncertain and involved, rarely admit of elucidation by the opposing party.

In considering the evidence and determining whether the compensation prescribed by law is destructive of property, the basis of estimation in a case like this will ordinarily be the reasonable, actual value of the property used in the business, cost of maintenance and the expense of carrying on the business properly. San Diego Land Co. *v.* National City, 174 U. S. 739, 755, 757. In the language of Mr. Justice Harlan in that case: "What the company is entitled to demand, in order that it may have just compensation, is a fair return upon the reasonable value of the property at the time it is being used by the public. The property may have cost more than it ought to have cost, and its outstanding bonds for money borrowed, and which went into the plant, may be in excess of the real value of the property. So that it cannot be said that the amount of such bonds should in every case control the question of rates, although it may be an element in the inquiry as to what is, all the circumstances considered, just both to the company and to the public."

The basis of actual value is peculiarly appropriate in this case.

As before stated, the defendant corporation was organized for the express purpose of acquiring and consolidating the business of separate organizations operating in Maryland and the District of Columbia. Its capital stock of $2,650,000 was not issued for money subscribed, but in payment for those properties; $1,900,000 was passed to and divided between the Maryland Company and American Bell Company, and $750,000 was delivered to the National Capital Company.

The actual value of the property received in exchange, as shown by the statements of the experts and derived from the defendant's books, was, in Maryland, $345,045.24, and in the District of Columbia, $168,465.14. Differences between these values and the face value of stock transferred are represented solely by arbitrary valuations of the franchises acquired. What these franchises may have consisted of in Maryland does not appear. There was no franchise acquired in the District of Columbia, and all that could be acquired in addition to the tangible property of the vendor company was what may be called the "good will" of an established business.

Since the aforesaid purchases, the defendant has issued and sold 6 per cent. bonds of the face value of $500,000. The general telephone business has been extended in Baltimore and to many towns in Maryland, as well as to some portions of West Virginia, and these

have been connected with each other and the main offices. Considerable extensions and changes have been made in the plant in the District of Columbia. During the years intervening between the dates of purchase aforesaid and the beginning of the fiscal year in 1898, great expenses, including interest on bonds, have been paid, and regular appropriations to sinking fund have been made. Something has been carried to surplus, and average dividends of a little more than 2½ per cent. have been paid on the full amount of the capital stock.

A very great if not insuperable difficulty in arriving at an accurate calculation of the legitimate cost of the service in the District, which is represented by an exceedingly high figure as compared with other telephone exchanges throughout the country, lies in the fact that it is a branch only of the wide-extended business of a single owner. On the books 40 per cent. of the bonds issued is charged against the District plant, and the latter is likewise charged with 40 per cent. of the general expenses of the company, as well as with its proportion of annual interest and sinking fund appropriations.

The evidence does not show that 40 per cent. of the bond sales was actually expended in betterments in the District, nor does it show that 40 per cent. of general expenses is the real and just proportion to be borne by the Washington plant. Baltimore is a considerably larger city than Washington, and has in operation about 25 per cent. more telephones, with toll-line connections with nearby towns and villages.

Then there are local exchanges in Maryland at Cumberland, Hagerstown, Frederick, Westminster, Annapolis, Mt. Washington, Lutherville, and in West Virginia at Martinsburg. Besides, all of these points are connected with each other by toll lines, and each has additional lines to smaller adjacent villages where no exchange is maintained.

Washington is connected with Baltimore and also, it seems, with Alexandria and Waterloo, Va. The general officers of defendant, including superintendents of construction and of inside and outside maintenance, live in Washington, and considerable items of general expenses consist in traveling expenses caused by the wide dispersion of the business under their charge.

Turning now to the annual expenses of the Washington plant, including the foregoing proportion of general expenses, we find that Haskins, the expert accountant who testified for the defendant, estimates them for the six years from 1892 to 1897, inclusive, as averaging $66.57 per telephone. In estimating annual expenses, as for maintenance and the like, he includes large annual rentals for receivers and transmitters paid to the American Bell Telephone Company, which appears to own a majority of defendant's capital stock under the old contracts of 1883 and confirmations, 40 per cent. of annual interest upon bonds and some miscellaneous interest, and 40 per cent. of annual appropriations to the sinking fund. In addition he charges a great proportion of the cost of additional underground construction and the substitution of improved appliances and so forth, together with all costs of subscribers' connections.

The most of these inclusions as charges to current expenses of maintenance we regard as inadmissible. Whether these may be admissible as between stockholders and corporation is not the question.

1178 The interests of the public are here involved and a very different question is presented when they are relied upon as a ground for the resistance of the right of public regulation.

It is plain that interest and sinking fund items are not chargeable as expenses, and we understand this is virtually conceded. There is no proof that justifies the payment of the annual rentals to the parent Bell Company. Patents existing when the 1883 contracts were made have necessarily expired, and the evidence shows that instruments of equal efficiency can be purchased in open market for a sum slightly in excess of one year's rental charge. The right to charge certain improvements to maintenance is more doubtful. Probably the cost of connecting new subscribers may be charged to expenses, because when discontinuances are made the connections become valueless. At the same time, as the majority are practically permanent and productive of revenue, some division of charge between construction and maintenance would seem equitable. Whatever is necessary through ordinary wear or accident to keep the plant in good, serviceable condition is properly chargeable to expenses. On the other hand substitutions of improved appliances for others in serviceable order in order to obtain increased efficiency, as well as increase of plant, would seem to be properly chargeable to construction. It appears that the defendant had, some years ago, laid certain cables in the underground conduit after a plan called the "solid system," at an expense of about $115,000. An objection to this system was that cables could not be drawn out and repaired or substituted; and another, that additional cables could not be added. Underground-construction is expensive, and particularly so where asphalt pavement must be removed and relaid.

This old cable was not abandoned because worn out or incapable of working efficiently. It was not torn up, but a new excavation was made alongside, in which sections of terra-cotta conduits were laid. These separate conduits would admit cables composed of 50, 100 and 150 wires, as were then manufactured. Expensive manholes were constructed at intervals, so that the lead-covered cables could be drawn through the conduits as required for construction or repair. The new subways were provided with a considerable amount of extra conduit, so as to permit the growth of the exchange to about double its then number of subscribers.

Under the conditions stated this new subway, with its extra conduits, should have been charged to construction. This we think is in accordance with the doctrine enounced by the Supreme Court of the United States in the only case in which the question seems to have been considered—U. P. R. R. Co. *v.* United States, 99 U. S. 402, 420.

The rule, in our opinion, as between corporation and the public, would be the same that seems to apply in the case of the conversion

of a horse railway into one operated by cable or underground electric current, or the erection of extra tracks by steam railway companies.

The defendant also claims the right to charge against annual expenses from 10 to 15 per cent. of value of plant on account of depreciation, although this item does not appear in the figures of the expert Haskins.

We cannot agree to this proposition. It is covered by the *regular* annual charge of maintenance, which includes all repairs and substitutions of defective and worn-out materials, in order to maintain efficiency of operation.

It is impracticable from the evidence to say just what reductions may be made for any one of the years given, on account of the cost of the new underground construction.

Averaging it, with considerable uncertainty, and making the other deductions mentioned, the average annual expense per year, for the six years, would be less than $50 per telephone subscriber, leaving a possible margin for dividends of from 2 to 3 per cent. upon the actual cost of the plant, which is estimated at from $428,000 to $450,000.

The expenses varied considerably during the years embraced in the statement, showing a very great excess for 1897 over the average. This has been ascribed largely to extraordinary repairs made that year on account of delay in permission of the public authorities to make improvements. It would seem that considerable part of this, but how much is unascertainable from the evidence, is due to the improved conduit system before mentioned. Moreover, the president's report to stockholders, under date of January 31, 1898, shows an increase of 783 poles in the erections for the year.

Coming down to the evidence of expenditures for the first three quarters of the year 1898, Haskins shows total expenses for the whole year, estimating the coming quarter at the same proportion, to amount to $151,371.57, which is less than the expenditures of 1897.

Continuing his system of charging expenses, he estimates the cost for the year per telephone—taking 2,126 as the average number—at, say, $71.25.

Deducting interest, sinking fund and rentals as not properly chargeable to expenses, the cost per telephone would be about $53, making expenses exceed income, at the $50 rate, about $6,500 for the year.

Appellants contend that this difference would be more than set off by deducting from salary charges the traveling expenses of officers and the unnecessary cost of services in general. They would deduct for the former $4,106.74, and for the latter $19,248.31.

This last deduction would embrace the proportion of general salaries charged to the Washington plant, which amounts to $10,918.40, with a reduction of, say, $9,000 from local expenses as excessive and unreasonable to that extent.

That there should be some deduction on account of these expenses seems reasonable, but what that reduction should be does not satisfactorily appear from the evidence. Appellee's statement of the expense per telephone of salaries and wages alone is at the rate of

$37.70 per year in the District of Columbia. This is much greater than the total expense per telephone in many other places given in the testimony. For example, Toronto, Canada, with 5,932 stations, estimates expenses at $25.26 per station; Detroit, Mich., 4,636 stations at $20.95 per station. Some smaller cities, none of which, save Grand Rapids, Mich., have more telephones than
1179 *Washington, range from $12.50 to $24 per station.* Conditions are frequently so different that the expense of operation in one city does not furnish a safe rule of comparison for others. Conditions in Washington are peculiar in that its streets and avenues are much wider than those of others brought into comparison, and the average distance required to reach subscribers is much greater. Besides, conditions of construction are more onerous in several respects.

At the same time it does not seem reasonable that these conditions are sufficient to account for the great difference in expense shown in the several tables of charges, particularly those of salaries and wages per telephone.

Again, it does not appear what proportion of expense is due to the outside connections. There are also a considerable number of what are called private lines, that do not enter into the general service. What figure these ought to cut in the calculation of expenses does not plainly appear to us.

As the judgment appealed from must be reversed upon the ground first stated, regardless of the fact that the statutory rate might be most unjust, we have not made up a particular statement of all the many items entering into that consideration.

If the case turned upon this point we would have great difficulty in determining from the mass of figures and opinions in evidence what particular rate would cover legitimate expenses and afford any return for the money invested, and would feel a strong inclination to remand the cause for the introduction of additional evidence upon some of the points of difficulty that have been suggested, and with direction for reference to the auditor to find and report all of the necessary facts with all necessary or important computations and estimates.

The most that we now feel called upon to say is that our examination of the evidence does not satisfy us that the necessary effect of the enforcement of the rate will be destructive of defendant's rights of property.

For the reasons given the decree will be reversed, with costs, and the cause remanded for the entry of a decree granting the injunction in conformity with this opinion. Reversed.

Mr. Chief Justice Alvey concurs in the judgment.

1180 TUESDAY, *May 21st, A. D.* 1901.

J. FORREST MANNING and HARRY E. Rupprecht, Trading as J. Forrest Manning & Co., Appellants,
vs.
THE CHESAPEAKE AND POTOMAC Telephone Company.
No. 1003. April Term, 1901.

Appeal from the supreme court of the District of Columbia.

This cause came on to be heard on the transcript of record from the supreme court of the District of Columbia, and was argued by counsel. On consideration whereof, it is now here ordered, adjudged and decreed by this court that the decree of the said supreme court in this cause be, and the same is hereby, reversed with costs; and that this cause be, and the same is hereby, remanded to the said supreme court, for the entry of a decree granting the injunction in conformity with the opinion of this court.

Per MR. JUSTICE SHEPARD.

May 21, 1901.

(Mr. Chief Justice Alvey concurs in the judgment.)

1181 TUESDAY, *June 4th, A. D.* 1901.

J. FORREST MANNING and HARRY E. RUPPRECHT, Trading as J. Forrest Manning & Co., Appellants,
vs.
THE CHESAPEAKE AND POTOMAC TELEPHONE COMPANY.
No. 1003.

On motion of Mr. A. S. Worthington of counsel for the appellee in the above-entitled cause, it is ordered by the court that said appellee be allowed an appeal to the Supreme Court of the United States on giving bond to act as supersedeas in the sum of two thousand dollars.

1182 Know all men by these presents, that we, The Chesapeake and Potomac Telephone Company, as principal, and Fidelity and Deposit Company of Maryland, a corporation, of Maryland, having its principal office in Baltimore, Md., as surety, are held and firmly bound unto J. Forrest Manning and Harry E. Rupprecht, trading as J. Forrest Manning & Company, in the full and just sum of two thousand dollars to be paid to the said J. Forrest Manning and Harry E. Rupprecht, trading as J. Forrest Manning & Company, their certain attorney, executors, administrators, or assigns; to which payment, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally by these presents.

Sealed with our seals and dated this 4th day of June, in the year of our Lord one thousand *eight* hundred and *ninety*-one.

Whereas, lately at a Court of Appeals of the District of Columbia, in a suit depending in said court, between said J. Forrest Manning

and Harry E. Rupprecht, trading as J. Forrest Manning & Company and The Chesapeake and Potomac Telephone Company a decree was rendered against the said The Chesapeake and Potomac Telephone Company and the said The Chesapeake and Potomac Telephone Company having obtained an appeal and filed a copy thereof in the clerk's office of the said court to reverse the decree in the aforesaid suit, and a citation directed to the said J. Forrest Manning and Harry E. Rupprecht citing and admonishing them to be and appear at a Supreme Court of the United States, to be holden at Washington within 30 days from the date thereof,

Now, the condition of the above obligation is such, that if the said The Chesapeake and Potomac Telephone Company shall prosecute its said appeal to effect, and answer all damages and costs if it fail to make its plea good, then the above obligation to be void; else to remain in full force and virtue.

Sealed and delivered in the presence of—

THE CHESAPEAKE & POTOMAC TELEPHONE —, [SEAL.]

By HORACE S. CUMMINGS, [SEAL.]
Vice-President.

Attest:
CHAS. G. BEEBE, *Secretary.*
R. F. WAUGH.

[Seal of Chesapeake and Potomac Telephone Co.]

FIDELITY & DEPOSIT CO. OF MARYLAND, [SEAL.]
By W. H. RONSAVILLE, *Attorney-in-fact.*

[Seal of Fidelity & Deposit Co. of Maryland.]

Approved by—
R. H. ALVEY, *Ch. Justice.*

10c. cancelled internal-revenue stamp.

[Endorsed:] No. 1003 J. Forrest Manning & Co. *vs.* The Chesapeake & Potomac Telephone Co. Supersedeas bond on appeal to Supreme Court United States. Court of Appeals District of Columbia Filed Jun- 5, 1901. Robert Willett clerk

1183 UNITED STATES OF AMERICA, *ss:*

To J. Forrest Manning and Harry E. Rupprecht, trading as J. Forrest Manning & Co., Greeting:

You are hereby cited and admonished to be and appear at a Supreme Court of the United States, at Washington, within 30 days from the date hereof, pursuant to an order allowing an appeal, filed in the clerk's office of the Court of Appeals of the District of Columbia, wherein The Chesapeake and Potomac Telephone Company is appellant and you are appellees, to show cause, if any there be, why the decree rendered against the appellant, should not be corrected,

and why speedy justice should not be done to the parties in that behalf.

Witness, the Honorable Richard H. Alvey, Chief Justice of the Court of Appeals of the District of Columbia, this fifth day of June, in the year of our Lord one thousand nine hundred and one.

R. H. ALVEY,
Chief Justice of the Court of Appeals of the District of Columbia.

Service accepted this 6th June 1901.

A. A. BIRNEY,
Of Counsel for Appellee.

[Endorsed :] Court of Appeals, District of Columbia. Filed Jun-7, 1901. Robert Willett, clerk.

1184 Court of Appeals of the District of Columbia.

I, Robert Willett, clerk of the Court of Appeals of the District of Columbia, do hereby certify that the foregoing printed and typewritten pages, numbered from 1 to 1183, inclusive, contain a true copy of the transcript of record and proceedings of said Court of Appeals in the case of J. Forrest Manning and Harry E. Rupprecht, trading as J. Forrest Manning & Co. appellants *vs.* The Chesapeake and Potomac Telephone Company, No. 1003, April term, 1901, as the same remain upon the files and records of said Court of Appeals.

Seal Court of Appeals, District of Columbia.

In testimony whereof I hereunto subscribe my name and affix the seal of said Court of Appeals, at the city of Washington, this 27th day of June A. D. 1901.

ROBERT WILLETT,
Clerk of the Court of Appeals of the District of Columbia.

Endorsed on cover: File No. 18,216. District of Columbia Court of Appeals. Term No. 363. The Chesapeake and Potomac Telephone Company, appellant, *vs.* J. Forrest Manning and Harry E. Rupprecht, trading as J. Forrest Manning & Co. Filed July 5th, 1901.